PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Vol. CVIII, No. 9 Thursday, March 2, 1939 Price Ten Cents

GermanySteadyBuyerofCanadianPulpwood

While General Market Is Dull Substantial Sales of Pulpwood Are Made To Germany—Newsprint Exports Show Encouraging Increase In January Over Same Month Last Year—Shipments of Wood Pulp are Higher.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 1, 1939—Some attention is being given to the continued exports of Canadian pulpwood from Canada to Germany. While the market generally for pulpwood is dull, there is a steady purchase of pulpwood by Germany, and further substantial sales are being made to that country. Practically all these purchases have been made in the Martime Provinces since the German proposal for the purchase of the pulpwood on Anticosti Island fell through.

These German purchases account for the fact that total exports of pulpwood from Canada are increasing in value, despite general lack of demand. The total exports of pulpwood from Canada for the ten months of the current fiscal year up to the end of January last amounted to 1,388,697 cords, as compared with 1,433,543 cords in the similar 10 months of the previous fiscal year, but the value was $12,476,561, as compared with $11,482,665. Thus while 44,846 fewer cords were exported, the total value of the exports increased by $993,896.

The subject has been brought up in the New Brunswick Legislature, E. W. Melville giving the opinion that pulpwood exports to Germany should be prohibited.

To this suggestion R. J. Gill replied that although the people of the lumbering districts concerned had no love for the German system of government, they hoped to continue exporting pulpwood to that country until they were able to obtain a mill of their own.

Any ban under present circumstances would cause great hardship for the people of his constituency, he said. They deplored the necessity of exporting raw material but had no alternative as they lacked the means of processing it, and Germany offered the only market.

Newsprint Exports Increase

Government returns show a substantial increase in newsprint exports in January as compared with those in January of last year. The total exported for the month was 3,872,489 cwts., valued at $8,290,258, as compared with 4,229,033 cwts., valued at 9,049,872 in December and 3,390,182 cwts., valued at $6,816,828 in January, 1938. Of this total 3,251,875 cwts., valued at $7,055,458, went to the United States; 307,241 cwts., valued at $660,515, to Australia; 185,222 cwts., valued at $297,145, to the United Kingdom; 58,836 cwts., valued at $133,345 to British South Africa; 18,126 cwts., valued at $39,495, to New Zealand; 16,382 cwts., valued at $22,022 to Ireland (Eire); 16,101 cwts., valued at $31,825, to Cuba; and the remainder to 17 other countries.

Wood Pulp Exports Rise

Of wood pulp and screenings the total exports were 941,245 cwts., valued at $2,227,779, as compared with 753,124 cwts., valued at $2,149,823 in January, 1938. Exports of pulp and fibre wall boards totalled 32,459 cwts., valued at $111,184, as compared with 38,258 cwts., valued at $126,600 in January, 1938.

Total exports of paper and manufactures of paper in January were valued at $8,898,811, as compared with $7,710,020 in January, 1938.

To Build Sulphite Plant at Cuneo

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 2, 1939—The erection of a new sulphite pulp plant at Cuneo, Italy has been planned by the Societa Cellulosa d'Italia, according to reports from the office of the American Commercial Attache, Rome. Chestnut refuse from which tannin has been abstracted and pine wood of the Cuneo valleys will be utilized as raw materials. An area of 250,000 square meters has been selected, ⅓ of which will be covered by the plant and smaller buildings, the balance being utilized for warehouse, laboratories, and offices. A total of about 300 operatives and a staff of about 20 persons, between technicians and employees, will be initially engaged by the firm.

The construction of the plant will be completed and machinery installed within the current year. Details are not given regarding the cost of the establishment. An arrangement has been made with the Forest Militia for wood supplies which are calculated at 50,000 to 60,000 metric tons for the first year, with an ultimate consumption of 100,000 tons in view. An estimate of the yearly production of paper pulp is given at between 20,000 and 50,000 metric tons. In addition to production of pulp, the company's program embraces the manufacture of high-class fiber suitable for the production of rayon. The latter will be obtained by the processing of mulberry and beach-tree wood.

Natl. Labor Board Bans Independent Union

Nekoosa-Edwards Paper Co. Ordered By National Labor Relations Board To Withdraw Support of Company's Union and Recognize American Federation of Labor—Appleton Wire Works Expanding — Trade News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., February 27, 1939—Under an order issued last week by the National Labor Relations Board at Washington, D. C., the Nekoosa-Edwards Paper Company must withdraw recognition and support of the Nekoosa-Port Edwards Labor Union, an independent union. The company is ordered to recognize and bargain upon request with the American Federation of Labor as exclusive representative of all production and maintenance employees, excluding supervisory and clerical employees, but including power and laboratory employees, in one unit embracing both of its mills at Nekoosa and Port Edwards, Wis.

The board held that the independent union was company supported and was the successor to a "company-inspired mill plan which formerly existed at both plants."

Reinstatement also was ordered of Romeo Plenge, with full restoration of senority and other rights, to his former position at the Nekoosa mill, and with back pay from September, 1937. Plenge's discharge was the major subject of hearings conducted by NLRB for seven days last February at Wisconsin Rapids, Wis., held on complaint of AFL unions. At that time an election held among employees was contested when the company recognized the independent union as the result of balloting.

The decision affects 1,012 employees, of which it was said AFL unions represented 669. The board said the Wagner Act had been violated in refusing to bargain with them. The unions to be recognized are the International Brotherhood of Paper Makers, the International Association of Machinists, and the International Brotherhood of Pulp, Sulphite and Paper Mill Workers.

No decision has been announced by the company as to what action it will take on the board's decision. The unions, however, consider it "a 100 per cent victory."

To Stop Sludge and Waste in Fox River

Orders have been issued to the Interlake Pulp and Paper Company division of the Consolidated Water Power and Paper Company at Appleton, Wis., to stop discharging sludge and waste materials from its sulphite acid storage tanks into the Fox River. The order was issued by Adolph Kannenberg, chairman of the state committee on water pollution, and the Wisconsin State Board of Health.

The company also is ordered to construct a waste sulphite liquor treatment plant as soon as a practical method of treatment is available.

The order resulted from an investigation into the cause of the death of great numbers of fish in September, 1937. It was found that the mill had cleaned the sludge from one of its acid storage tanks and flushed it into the river, and the trouble was attributed to this act.

C. K. Boyer, manager of the mill, declares the company has not discharged the storage tanks into the river since the board of health held hearings more than a year. The company has not decided how it will take care of its waste materials in the future, he said.

Agitation also has been started at Neenah, Wis., to compel mills to make connections with the municipal sewage disposal plant, because of complaints of sportsmen that fish in Lake Winnebago and Little Lake Butte des Morts were being killed by the discharge of waste. The city council has asked the superintendent of the sewage plant to make an official report on the situation.

Appleton Mill Works Expanding

Appleton Wire Works, Appleton, Wis., expects its 1939 business to continue at about the same pace as the last six months of 1938. "The first six months of last year were below par because of over-buying the previous year," said William E. Buchanan, president of the company. "Business improved during the last six months, and we expect it to hold about the same level this present year."

An expansion program has been carried on during the last few months to make the company more self-sufficient, and to engage in work formerly done by outside concerns. A new building was completed in which additional wire drawing machines have been installed. A research laboratory also was built of brick, with glass block windows, and will soon be fitted with equipment. The company has added 50 men to its payrolls within the last four years, and now has 150 employed.

Tolls Against Paper Mills Approved

Tolls of $137,303 assessed against paper mill and water power owners along the Wisconsin River have been approved by the Wisconsin Public Service Commission. They were fixed by the Wisconsin Valley Improvement Association, cooperative organization controlling flow of water, covering the cost of operations for the last six months of 1938. The order was issued subject to reconsideration, however, because questions of charges to be assessed against the Nekoosa-Edwards Paper Company were in dispute. This company's share of the assessments for its three dams was set at $21,491.

To Oppose Higher Freight Rates

The Wisconsin Paper and Pulp Manufacturers' Traffic Association and the Wisconsin Public Service Commission will work together in opposing proposed freight rate increases to points in the southwest, according to announcement made last week. Both will be represented at hearings before the Interstate Commerce Commission in Washington, D. C., starting March 1. To avoid duplication, the association will present the rate testimony, and the commission

staff will present testimony on the statistical and economic siuation.

Division of the work was arranged at a meeting in Chicago between J. E. Bryan of the association, and P. H. Porter, transportation director, and W. F. Ehmann and C. E. Schreiber, chiefs respectively of the commission's transportation, tariffs and statistic departments.

Decision on Flowage Rights Deferred

No decision will be issued until the middle of March by the Wisconsin Public Service Commission on re-hearings recently conducted giving the city of Kaukauna, Wis., the right to enter into a contract with the Green Bay and Mississippi Canal Company to take over flowage rights on the Fox River in exchange for certain real estate. The deal was made to give the municipal utility the benefit of 100 per cent flowage for its new power plant, to be erected on the site of the former Patten Paper Company mill. Purchase of the mill property gave the utility one-third of the flow, and the city council made the contract to utilize 100 per cent flow after leaving the canal company's power plant. A citizens' organization protested the deal, and appealed to the commission to set it aside.

More Acreage Added to Pulpwood Stands

Extensive additions will be made to the land set aside for growing pulp wood, according to announcement of the Wisconsin Conservation Commission. Tentative approval has been given to applications from 17 counties, embracing 78,060 acres of land. Previously, the commission had 1,876,744 acres seggregated under the law. This arrangement permits land owners to pay taxes only on the timber when cut except for an annual fee of ten cents per acre otherwise.

Reif-Litcher Nuptials

Miles Reif of Appleton, Wis., an engineer for the Kimberly-Clark Corporation, and Miss Jane Litcher of Fond du Lac, Wis., were married Saturday, February 18 at St. Rose Church, Milwaukee, Wis. The couple will reside at Appleton.

N. E. Paper Box Men on Vacations

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 27, 1939—A number of the paper box manufacturers are having winter vacations.

Edgar A. Abrahams, of the Box Craft Company and the Paper Goods Company, Cambridge, Mass., sailed February 25 on a tropical cruise to Havana, Cuba.

Frank Babcock, assistant treasurer of the Consolidated Paper Box Company, Somerville, Mass., is sojourning in Florida for six weeks.

Lawrence Cohen, of the Acme Paper Box Company, East Boston, left February 21 for a circuit of the United States by air, including Boulder Dam and the Pacific Coast.

W. W. Sample, of the Sample-Durick Company, Inc., Indian Orchard, Mass., accompanied by Mrs. Sample, sailed from Halifax February 18 on a vagabond cruise to the South Atlantic, to be away six weeks.

Maine Men Hold Luncheon

The pulp and paper alumni of the University of Maine held a luncheon at the Roosevelt Hotel on Wednesday, February 22. George D. Bearce of the Maine Seaboard Paper Company presided as Chairman. Philip Bolton of the Clinton Company was elected Chairman for the coming year.

J. G. L. Caulfield, assistant professor of pulp and paper technology outlined the progress being made in the school at Orono and announced that the pulp and paper course has been transferred from the chemistry to the chemical engineering department. Prof. Caulfield mentioned the need for new equipment. To assist in obtaining such equipment a committee was appointed consisting of George D. Bearce, Clifford Patch and D. M. Shapleigh.

A. H. White, engineer of the International Paper Company and a member of the Class of 1885 made a few remarks and stated that Maine should be proud of the work its alumni has done for the paper industry.

R. G. Macdonald, secretary of TAPPI, announced the effort that is being made to establish a local section of the association in Maine and outlined how such a group may be organized.

Those present were: Fred Soderberg '25, General Dyestuff Corporation; M. B. Pineo '33, Scott Paper Company; E. A. Ellis '32, Dowingtown Manufacturing Company; Jack Dickson '32, R. T. Vanderbilt Company Inc.; Gus Gregory '25, Maine Seaboard Paper Company; Fred Sprague '36, Maine Seaboard Paper Company; D. M. Shapleigh '25, Hercules Powder Company; L. Schweitzer '19, Peter J. Schweitzer Inc.; Ralph A. Wilkins '19, Bird & Son Inc.; D. D. Uong '26, Fitchburg Paper Company; Roger B. Hill '18, Marquardt & Company Inc.; Walter A. Littlefield '25, Brown Company; Mose Hescock '22, Brown Company; James E. De Courcy '34, Walden Sons & Mott; Nat Scher '35, Sav-Mor Corporation; Olin W. Calligan '24, Edgar Brothers Company; Steven Dunham '18; J. J. Thompson '30 (Purdue) Worthington Pump and Machinery Corporation; Skip Anderson '23, Hooker Electrochemical Company; Bill Huestis '29; Henry Booth '32; Phil Bolton '13, Clinton Company; R. H. Doughty '25, Fitchburg Paper Company; L. S. Dixon '08; L. H. Reed, '23, Southern Kraft Corp.; F. W. O'Rourke '16; A. W. Nickerson '16; C. H. Champion '19, R. T. Vanderbilt Company; R. M. Leighton '12, Stowe & Woodward Company; E. Mansfield '16, Robt. Gair Company; W. E. Brawn '17, Pejepscot Paper Company; Cliff Patch '11, Eastern Manufacturing Company; C. E. Libby '16, N. Y. State College of Forestry; R. G. Macdonald, TAPPI; G. D. Bearce '11, Maine Seaboard Paper Company; A. H. White, '89, International Paper Company; E. P. Ingalls '15, S. D. Warren Company; J. G. L. Caulfield, '24, University of Maine, L. C. Jenness '25, University of Maine.

Reichhold Opens Office

On February 1, Reichhold Chemicals and the Fred L. Lavanburg Company established a branch office in Buffalo, at 901 Liberty Bank Bldg., in charge of Selden G. Hait, Jr., who has, for the past seven or eight years, represented the Fred. L. Lavanburg Company in the Cleveland district.

Manager of Great Lakes Paper Co. Resigns

At Meeting of Directors L. J. Heit Leaves Post of General Manager of Great Lakes Paper Co. — Shipments of Company 32.5 Per Cent Lower Than In 1937—Abitibi Bondholders Formulating New Plan—Late News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., February 28, 1939—Following the issuing of the annual report of the Great Lakes Paper Company, Limited, Fort William, Ont., at a meeting of the directors, L. J. Heit resigned as general manager and John W. McCurdy, of Chicago, as director. Arthur D. Cobban, of Toronto, was elected vice president to take the place of the late E. G. Long, K. C., of Toronto. Richard G. Meech, of Toronto, who is the present secretary, was elected to the Board. Hon. Earl Rowe, president of the company, reported that paper shipments for 1938 were 76,007 tons or 32.5 per cent lower than in 1937. Manufacturing costs had increased owing to restricted volume and to higher cost in labor, raw materials and supplies. Net operating profit for the year was $805,964, against $915,946 in 1937. During the year, capital expenditure totalling $52,808 was made to the mill to effect improvement in manufactured products and economic operation. The program of expenditure started in 1937 for necessary dams, roads, etc. on timber areas was completed in 1938.

The report of 1938 shows net profit of $134,491 after depreciation, bond interest and taxes which is equal to 67 cents per share on 200,000 shares of class A and class B preferred shares outstanding. This compares with a net profit of $245,278 or $1.23 per preferred share in 1937. Both class A and class B preferred stock is entitled to dividends of $2 a share per year and are in arrears from October 1, 1935. The balance sheet shows current assets of $2,470,799 and current liabilities of $879,812, leaving net working capital of $1,590,987.

Abitibi Bondholders May Foreclose

It is understood that representatives of the bondholders of the Abitibi Power & Paper Company, Toronto, are working on a plan involving foreclosure under the first mortgage and the offering of rights over a three year period for redemption of the property. It is said that no approach has been made as yet to the preferred and common shareholders although representatives of these groups have been informed of the lines taken in the bondholders' discussions. While it is obvious that no definite reaction to the bondholders' proposal can be forthcoming from junior security holders until all details are known, preliminary discussions indicate that any proposal such as that initially proposed will be opposed in the courts by the preferred and common shareholders with or without any three year redemption clause. In addition the legal rights of bondholders to foreclosure would also provide long drawn out legal fights.

The earnings of the Abitibi Company for the month of January, 1939, prior to charges for depreciation of $148,750 and for bond interest of $271,501, amounted to $162,297. Earnings, prior to charges for depreciation and bond interest amounted in December, 1938, to $304,284 and in January, 1938, to $114,219. Shipments of newsprint in January, 1939, amounted to 21,688 tons as compared with 29,313 in December, 1938, and 18,058 in January, 1938. Shipments of sulphite pulp in January 1939 amounted to 3,422 as compared with 2,806 in December, 1938, and 2,150 in January, 1938.

Provincial Earnings 28 Per Cent Lower

The net profits of Principal Paper, Limited, Toronto, during the year ended December 31, 1938, showed a decline of 28 per cent from 1937. The net profit of $242,202 compared with $340,941 in the previous year. After preferred dividends amounting to $245,000, surplus account was reduced to $1,003,-291 from $1,006,088. Net operating profits, after income taxes, totalled $749,804 against $852,664 a year earlier. Depreciation took $300,000 and bond interest $207,602, the balance being equal to $6.92 on the seven per cent preferred stock against $9.74 in 1937. Principal amount of bonds outstanding was reduced during the year by $449,500 from $3,849,500 to $3,400,000. Working capital was $2,482,251 compared with $2,675,118. Current assets amounted to $2,894,974 and current liabilities to $412,723. Total assets amounted to $12,687,602 at the year end against $12,831,936. S. F. Duncan is president of Provincial Paper.

Rayon Concern May Finance Sulphite Co.

It is understood that representatives of a rayon thread concern from the United States have visited the plant of the Lake Sulphite Pulp Company, Limited, at Red Rock, Ont., with a view to possible advancing of funds to complete the plant. Construction on the Lake Sulphite mill was halted a year ago when the company was placed in the hands of a receivership. Since then several plans for the reorganization of the company have been under consideration and latterly these have taken the line of discarding the original scheme to manufacture high grade sulphite pulp and convert the mill to rayon pulp. It has been estimated that about $1,250,000 will be needed to complete the project in addition to the $3,500,000 of bonds held by the company which may be issued.

Corrugated Paper Box Company, Limited, Toronto, reports for the fiscal year ended December 31, 1938, net profits of $39,534, after depreciation, taxes and write down for investments equal to $5.68 per share on the 6,960 shares of seven per cent preferred on which there are arrears of dividends outstanding at the end of the year. This compares with profits of $77,246 or $10.64 on the 7,260 shares of preferred outstanding at the end of 1937. A. T. Whealy, president of the company, attributed the sharp decline in net profits to smaller volume and lower selling prices. The demand for shipping cases was smaller than in 1937, with the result that the company produced seven per cent less tonnage. Volume of orders so far in 1939 have been slightly lower than for the corresponding period in 1938.

Chicago Reports Favorable Trade Prospects

Gains Continuing In Book and Kraft Papers With Outlook Good Despite Lagging Demand In Some Other Lines—Waste Paper Market Improved As Stocks On Hand Decline — New Trucking Act May Increase Costs.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., February 27, 1939—Market news in the Chicago area continued to be favorable although there were reports of slackening in demand in certain lines. Gains reported in the book paper market and those registered in the upturn in demand for kraft were indicated as continuing. The sulphite bond market was steady though demand was slightly less spirited than was the case a week ago. The general bond and ledger market continued fairly strong. Covers were about the same as last week while ground wood and newsprint papers reflected a slight decrease in demand brought about by a number of factors, including a natural slight slowing up in view of the marked improvement in demand during the past few weeks. The best news was noted in the waste paper market where a marked decrease in stocks on hand plus an improved demand brought about an appreciable degree of firmness in virtually all grades.

New Trucking Act May Add to Delivery Costs

The paper industry in Illinois has a new source of concern in the recently proposed Illinois Trucking Act, S.B. 93-H.B. 151. The proposed regulatory measures are aimed at certain monopolistic tendencies in the State but also carry a great deal of restriction and qualification covering all sorts of trucking and having a definite effect on delivery cost. The proposal carries classifications ranging from line haul or common carriers operating on specified routes, to so-called specialized carriers requiring special equipment such as block and tackle, cranes or windlasses to handle shipments. Discriminatory features of the Act have been cited by certain shipping groups who have called attention to the fact that line haul and metropolitan carriers may obtain certificates only on proof of convenience and necessity while local and specialized carriers must be granted certificates merely on the basis of an application accompanied by the affidavits of 25 shippers or legal voters in the territory to be served on the basis that the proposed services and operations are required by public convenience and necessity. In the case of contract carriers, the application need be accompanied only by one written bilaterial continuing contract for shipping service. The Trucking Act, a voluminous piece of legislation developed by the Uniform Motor Vehicle Commission, has many good points about it although, unless materially amended, it might prove a genuinely serious additional cost burden to members of the paper industry depending on the trucking industry for much of its transporting services as well as delivery features.

Proposed 2 Per Cent Sales Tax Deferred

The Illinois House of Representatives last week listened to arguments for and against the adoption of a 2 per cent gross receipts tax on manufacturing in this State, took no action following the hearing and gave an obvious indication of burying the proposal for the remainder of this session at least. The measure would have been exceedingly harmful to Illinois industry in competition with other States and on top of present costly operations. With this threat out of the way paper manufacturers and jobbers turned their attention to possible amendments to the Unemployment Insurance Act and learned this week that the possibility of an "agreed" bill would move the lower rate under merit rating from zero to either 0.5 or 1 per cent and the top figure to either 3.6 per cent or 4 per cent. The latter figure was estimated to be of a directly penalizing nature to employers in the paper industry who, because of unstable employment conditions through no fault of their own, would have to pay a higher rate of tax than the present figure. Unless these figures are agreed upon it is likely that the battle over amendments to the unemployment insurance act will actually become a feature of the present legislative session.

Scott Paper Co. Improvements

Announcement has just been made by Edward S. Wagner, first vice president and treasurer of the Scott Paper Company, Chester, Pa., that the $2,500,000 program of plant manufacturing expansion begun last July is rapidly nearing completion.

Within the past week steam generating facilities of the Chester plant have been increased from 250,000 lbs. per hour to 320,000 lbs. per hour by the completion of the installation of a Combustion Engineering Company type VU steam generator of 125,000 lb. capacity, 635 lb. pressure and 750° F.T.T., also two Foster Wheeler evaporators of 30,000 lb. output per hour to insure a continuous supply of condensate for boiler feed purposes.

Electrical output has been increased from 6,000 KW per hour to 11,000 KW per hour by the turning of steam into the new General Electric Double Extraction Turbine with a capacity of 5,000 KW at 80 per cent power factor electrical output. The first extraction point of the new turbine is 80 lbs. and the second 20 lbs. condensing to 28½ lbs. vacuum.

The new power plant equipment, now in operation, cost approximately $750,000 and is in addition to the new wide, high speed Beloit-built paper making machine which began operation several weeks ago.

German Machinery for Shanghai Mill

Orders have been placed in Germany for the purchase of equipment for producing five tons of newsprint paper daily, to be installed in the new Min Foong Paper Mill, according to reports from the office of the American Commercial Attache, Shanghai. The mill which will have a capital of 1,400,000 yuan was organized by Shanghai business and banking interests. The plant will be located in Kunming.

Financial News of Pulp and Paper Industry

Bartgis Bros. Co. Report Business In Good Order — Improvement Fund Appropriated — Orders Booked By Scott Paper Co. Again Exceed Production—Common Net Earnings $1,379,950—Donnacona Reports Profit.

NEW YORK STOCK EXCHANGE

High, Low and Last for the Week Ending March 1, 1939

	High	Low	Last
Armstrong Cork Co.	50¼	47¼	47⅝
Celotex Corp.	17¾	16	17
Celotex Corp., pf.	71	70	70
Certain-Teed Products Corp.	11¼	10⅛	10⅞
Certain-Teed Products Corp., pf.	43½	41	41½
Champion Paper & Fibre Co.	29	27⅛	29
Champion Paper & Fibre Co., pf.	99½	99½	99½
Congoleum-Nairn Co.	28½	26⅞	28¼
Container Corp. of America	14⅜	13¼	13⅞
Continental-Diamond Fibre Co.	8½	7⅞	8⅛
Crown-Zellerbach Co.	13¼	12⅜	12¾
Crown-Zellerbach Co., pf.	87	86¾	87
Flintkote Co.	29⅛	26⅝	28½
Robert Gair	3¼	3	3¼
Robert Gair, pf.	10⅞	10⅞	10⅞
International Paper & Power	12½	11½	11⅞
International Paper & Power, pf.	44¼	40⅞	42⅞
Johns-Manville Corp.	95½	90	94
Johns-Manville Corp., pf.	129½	129½	129½
Kimberly-Clark Corp.	25	25	25
MacAndrews & Forbes	31½	31½	31½
Masonite Corp.	52½	49½	52¼
Mead Corp.	10½	9½	10
Mead Corp., pf.	69⅜	69	69⅜
Paraffine Companies, Inc.	54½	52½	54½
Ruberoid Co.	29¾	29½	29¾
Scott Paper Co.	48¾	47½	48½
Scott Paper Co., pf.	115	114¾	115
Sutherland Paper Co.	29¾	29¾	29¾
Union Bag & Paper Corp.	10⅞	10⅜	10⅝
United Paperboard Co.	6½	6	6½
U. S. Gypsum Co.	101	91	101
U. S. Gypsum Co., pf.	177	177	177

NEW YORK CURB EXCHANGE

High, Low and Last for the Week Ending March 1, 1939

	High	Low	Last
American Box Board Co.	8⅜	8⅜	8⅜
Brown Co., pf.	17½	17	17
Great Northern Paper	38	38	38
St. Regis Paper Co.	3	2¾	3
St. Regis Paper Co., pf.	55½	55½	55½
Taggart Corp.	4⅜	4⅜	4⅜

Bartgis Bros. Co. Makes Good Report

E. H. Lupton in submitting the financial report of Bartgis Brothers Company for 1938 made the following statement: "Net sales totaled $791,120.38 which is approximately 6.3 per cent decrease from 1937 and 17.4 per cent increase over 1936. The net income after all charges, including depreciation, but before Federal and State income taxes and a settled litigation expense item of $5,317.83, amounted to $85.842.19. After deduction of Federal and State income taxes and settled litigation expense the net income available for dividends amounted to $66,-741.51. Preferred dividends amounted to $10,977.75, leaving $55,763.76 applicable to 108,052 common shares outstanding on December 31st, 1938, or 51 cents per share. Dividends at the rate of 25 cents per share on the common stock were paid during the year. Total dividends on the preferred and common stock paid during the year amounted to $37,990.75.

"The tons of paperboard produced were 15,231 tons, of which 14,452 tons were converted into folding cartons. We produced 14,320 tons in 1937; 12,048 tons in 1936 and 10,924 tons in 1935. The net profits, before all estimated Federal and State income taxes for 1938, per ton of board produced was approximately $5.22 per ton, compared with $9.75 per ton in 1937 and $6.40 per ton in 1936. The Company continues to operate at full capacity. Our selling prices in 1938 were considerably reduced. At the present time (January, 1939) there seems to be an improvement but selling prices are still low and our manufacturing costs have been increased. This increase is principally on account of the National Wage and Hour Law, requiring us to pay time and a half for working hours above forty-four hours per week. Up to the time of the National Wage and Hour Law we had only paid straight time for all hours of work.

"Capital expenditures in buildings and equipment were made during the year to the amount of $87,-014.79. The directors have authorized expenditures for 1939 for beater room equipment, paper machine additions, buildings and water power service to the extent of approximately $85,000. These expenditures and improvements are necessary to further improve the quality of our products as well as to increase our production. It is necessary for us to be at the top in the way of quality since our customers represent some of this country's largest and most critical carton buyers. These improvements probably cannot be finally completed before late in 1939, after which our production should be stepped up from approximately 15,000 tons per year to over 22,000 tons, or approximately 50 per cent increased production, which should give the company a still better earning capacity.

"The Company as of December 31st, 1938, had bank loans to the amount of $20,000.00 which on January 23rd, 1939, had been paid down to $10,000.-00. During the year our President, under a Prospectus, sold approximately 4,500 common shares of his personal holdings, the money from which he loaned to the company in the way of a deferred loan and which substantially helped the current cash position. Total deferred loans by officers now amount to $38,375.00."

Scott Paper Co. Reports $1,379,950

Scott Paper Company, Chester, Pa., manufacturer of toilet tissue and towels, reports for the year 1938 net earnings for common shares of $1,379,950, largest in the company's history. This is equal to $2.30 per share, calculated on the 598,664 shares outstanding December 31, 1938 as compared with $2.09 in 1937 on the same basis.

Dividends during the year were paid at the rate of $1.80 per share, including an extra dividend of $.20 per share. In 1937, the per share rate was $1.55, including an extra dividend of $.10 per share.

"Net sales were well maintained throughout the year and attained a new high annual record of $16,-149,000, an increase over the previous year of more than 16 per cent," Thomas B. McCabe, president of the company, stated in his annual message to the stockholders. Manufacturing facilities were operated at capacity throughout the year. Orders booked exceeded production for the third successive year, al-

though manufacturing output had been increased 16 per cent in 1938, 13 per cent in 1937 and 13 per cent in 1936 over the respective preceding years.

"During the year work was started on the largest expansion program the Company ever attempted at its Chester plant, involving estimated capital expenditures of $2,500,000. In this connection $1,302,000 was expended in 1938," Mr. McCabe said. This program includes a complete paper making unit, additional finishing equipment, additions to steam and electrical power generating and distribution plant, increases to water intake, filtration and storage facilities and river front improvements, including a pier for receipt, storage and handling of pulp.

On January 1st, 1938, the Company had outstanding $4,000,000 principal amount of 3¼ per cent Debenture bonds. This amount was reduced to $2,812,000 by the end of the year, $143,000 through Sinking Fund operations and $1,045,000 as a result of voluntary conversions into the Company's common shares at the rate of 25 shares for each $1000 bond. The conversion privilege expires March 1, 1942.

Donnacona Profit $501,700

The annual report of the Donnacona Paper Company for 1938 shows an operating profit of $501,700, as compared with $600,275 for the previous year. Interest on debt was higher during the year, on account of the increase in the coupon rate, so that practically all of the balance, $158,150, was reserved for depreciation and income taxes. During 1937 the company showed a net profit before depreciation and taxes of $309,079, and $40,856 after senior charges.

The balance sheet at the end of the year indicates a strengthening of position, with net working capital at $1,013,504, as against $880,663 at the close of the previous year. Inventories remain practically unchanged, while accounts and notes receivable jumped from $450,600 to $904,400. Among liabilities the principal changes include an advance in secured bank loans from $560,000 to $982,600 and a drop in the outstanding 5½ per cent notes from $727,500 to $703,500.

In his report to the shareholders, Robert P. Kernan, president, pointed out that newsprint sales in 1938 declined by about 22,000 tons, while sulphite pulp sales were off about 40 per cent from the 1937 level. As regards the current year, expectations are that there will be a moderate improvement in newsprint sales, as also for sulphite pulp. The latter will be at "a somewhat increased price."

Oxford Paper Co. Earnings Lower

The Oxford Paper Company reports for the year ended December 31, net income of $159,420 after all charges equal to $1.59 a share on the $5 preference stock. This compares with net in 1937, of $799,742, or 75 cents a share on the 381,139 shares of common stock, after preferred dividends. Balance sheet as of December 31 shows current assets of $5,784,984, including cash of $1,409,657, current liabilities of $2,632,616 and net working capital of $3,152,368. This compares with working capital of $3,545,581 on December 31, 1937.

Inventories totaled $2,583,605 against $3,041,558 at the end of 1937.

Maclaren Paper Makes Good Report

The annual report of the Maclaren Power and Paper Company for the fiscal year ended November 30 last shows consolidated net earnings from operations of $1,241,148, sufficient to meet bond interest, exchange, other interest, etc., of $1,104,782, and leave a balance of $136,366 available toward depreciation and charges of a non-recurring nature. In the preceding year net operating earnings amounted to $1,713,203 and after bond and other interest, etc., of $1,087,677, there was available for depreciation in that year $625,526. After providing $677,115 for depreciation for the 1938 period and expenses of a non-recurring nature of $71,945, there was a net loss for the year of $612,694, contrasted with a net loss of $139,196 in the previous year.

Crown Zellerbach Reports

The Crown Zellerbach Corporation and Subsidiaries report as follows for the nine months to January 31: Net profit after depletion and minority stockholders' proportion of net profit of Pacific Mills, Ltd., was $3,484,383, equal to 66 cents each on 261,199 shares of $5-par common stock outstanding after dividend requirements on the new $5 cumulative convertible preferred stock.

A. P. W. Paper Co. Reports Loss

The A. P. W. Paper Company, Inc., reports for the quarter ended December 31, loss $15,282 after taxes and charges; loss $99,537 in the same period of the preceding year and loss $1,735 in the quarter ended September 30, 1938. Six months ended December 31, loss $17,017; loss $100,926 in the like months of 1937.

Kimberly-Clark Vote Dividend

Directors of Kimberly-Clark Corporation have voted a dividend of 25 cents per share on common stock, and $1.50 on preferred, both payable April 1 to stockholders of record March 10. The dividend is the same as was paid January 1, and is at the same rate as the 1938 dividends which totaled $1.00 per share.

Hoberg Paper Mills Net $66,723

The Hoberg Paper Mills, Inc., report as follows for 1938: Net income, $66,723, equal after preferred dividends to 29 cents each on 92,995 shares of common stock. This compared with $180,418, or $1.51 a common share, the year before.

Eaton Paper Corp. Net $17,059

The Eaton Paper Corporation reports as follows for 1938: Net income, $17,059, equal to $1.46 each on 11,654 preferred shares, against $15,134, or $1.30 a preferred share, in 1937.

Hammermill Votes Initial Dividend

Hammermill Paper Company voted an initial dividend of $1.50 a share on the 4½ per cent cumulative preferred stock, payable April 1 to stockholders of record March 15.

Government Paper Bids and Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 1, 1939—Walker, Goulard & Plehn have been awarded the contract for furnishing the Government Printing Office with 4,800 pounds (30,000 sheets) of 24 x 36 No. 1 kraft paper at 5 cents, bids for which were received on February 10.

Barton, Duer & Koch will furnish 5,148 pounds (44,000 sheets of 24 x 38, 50 per cent rag, lithograph finish map paper at 10.2 cents, bids for which were received on February 6.

The Maxwell Paper Company will furnish 40,000 pounds (333,000 sheets) of 25 x 38 offset paper at 5.77 cents, bids for which were received on February 1.

R. P. Andrews Paper Company will furnish 1,000 pounds of specially treated tympan paper in 48 inch rolls at 22 cents; Butler Paper Company will furnish 1,600 pounds of 100 per cent rag, white chart paper at 16.28 cents; and R. P. Andrews Paper Company will also furnish 3,000 sheets of 16 x 18 waterproof ledger paper at $112.50.

The Printing Office has received the following bids for 4,000 pounds (25,000 sheets) of 75 per cent rag, 36 x 52 lithograph finish map paper: Barton, Duer & Koch Paper Company, 9.7 cents; Butler Company, 11.64 cents; Mudge Paper Company, 10.47 cents; Old Dominion Paper Company, 11.64 cents; and Walker, Goulard Plehn Company, 10.6 cents.

For 1,928 pounds (15,000 sheets) of 75 per cent rag, 30 x 40 lithograph finish map paper: Graham Paper Company, 15.99 cents; Stanford Paper Company, 9.92 cents; Barton, Duer & Koch Paper Company, 11.98 cents; Butler Company, 15.99 cents; Paper Corp. of U. S., 11.85 cents; and Old Dominion Paper Company, 15.99 cents.

For 11,640 pounds (40,000 sheets) of 50 per cent rag, 36 x 54 white lithograph finish map paper: Graham Paper Company, 11.64 cents; Stanford Paper Company, 9.92 cents; Barton, Duer & Koch Paper Company, 9.7 cents; Butler Company, 11.64 cents; Paper Corp. of U. S., 11.85 cents; Mudge Paper Company, 10.47 cents; Old Dominion Paper Company, 11.64 cents; and Walker, Goulard Plehn Company, 10.6 cents.

For 14,800 pounds (100,000 sheets) of 50 per cent rag, 26 x 38 white lithograph map paper: Graham Paper Company, 11.64 cents; Stanford Paper Company, 9.92 cents; Barton, Duer & Koch Paper Company, 9.7 cents; Butler Company, 11.64 cents; Mudge Paper Company, 10.47 cents; Mathers-Lamm Paper Company, 9.94 cents; Old Dominion Paper Company, 11.64 cents; and Walker, Goulard Plehn Company, 10.6 cents.

For 5,000 sheets of 24 x 36 of brown cloth lined cover paper: Whitaker Paper Company, $112.86 (all or none) and $121.16 per M sheets; Andrews Paper House of York, $127.07; Virginia Paper Company, $117.15; R. P. Andrews Paper Company, $116.83; Mathers-Lamm Paper Company, $113.43 (all or none) and $117.15; Walker, Goulard Plehn Company, $133.00; Nashua Gummed & Coated Paper Company, $131.00; Mudge Paper Company, $112.83 and $121.13; Cauthorne Paper Company, $113.40 (all or none) and $121.74; Stanford Paper Company, $119.00; and Thomas Barrett & Son, $118.94.

For 25,000 sheets same white: Whitaker Paper Company, $85.78 (all or none) and $90.47 per M sheets; Andrews Paper House of York, $87.54; Virginia Paper Company, $90.64; R. P. Andrews Paper Company, $88.80; Mathers-Lamm Paper Company, $75.12 (all or none), $90.65 and $78.83; Walker, Goulard Plehn Company, $93.00; Nashua Gummed & Coated Paper Company, $90.25; Mudge Paper Company, $85.77, $90.29, and $73,44; Cauthorne Paper Company, $86.19 (all or none) and $90.89; Stanford Paper Company, $77.50.

New-Principle Slitter

A high-speed slitter employing a new principle in rewinds has been announced by Potdevin Machine Company, 1223 38th street, Brooklyn, N. Y. By using an equalizing, but non-slipping, differential gearing for driving the rewinds. Potdevin has eliminated all possibilities of loosely wound rolls. Once the slitter is adjusted and set, the entire roll may be slit without further adjustment. Hardness of the rewinding rolls is controlled by means of a tension device on the parent roll. Each rewind shaft is also equipped with a braking device for controlling hardness of each roll separately.

These tension adjustments are particularly advantageous when slitting waxed, creped or extremely light-weight papers.

Since small diameter rolls require frequent stopping, Potdevin has made it possible to splice a second supply roll to the roll which is already in the machine.

Machines for slitting webs up to 60 inches in width are obtainable.

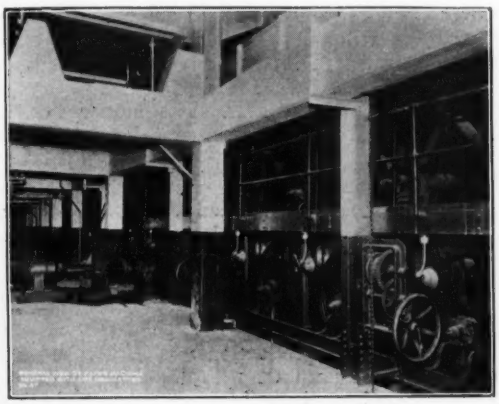
Syracuse Alumni Meets

The graduates of the New York State College, Syracuse, N. Y. who attended the TAPPI annual meeting met at 4:00 P. M. Wednesday, February 22nd for its annual reunion. Those present included: Prof. C. E. Libby, James Lyon, Arnold McAneny, James Casey, George Hollrock, Heinz Lips, Malcolm Lyon, Edwin Rothbauer, Lewis Burnett, Harry Weston, Sidney Dowst, Frederic Beyerberg, Fred O'Neil, Herman Schulman, J. C. Barthel, Richard T. Bingham, Edgemont Wennberg, Vernon Woodside, Harry O. George, Earl Knapp, O. Hisey, Charles Carpenter, D. E. Murray, J. R. Atwater, E. L. Lamb, Frederick Young, E. C. Jahn, C. L. Van Schaick, Harvey Cannon, Robert Huntley, W. S. Watchman, Irving Feldman, F. C. Clark, William Willets, Edgar Winne, C. M. Connor, A. H. Anderson, L. Justice and E. A. Worm, Jr.

New Coe Drainage System

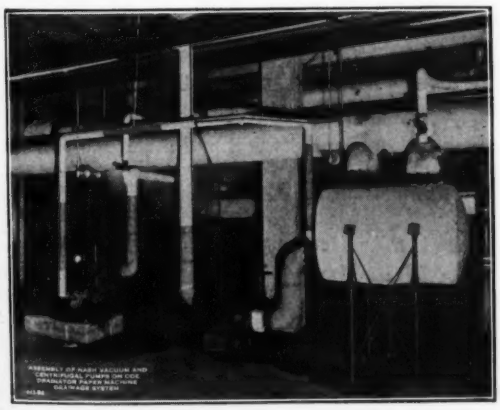
Engineers of the Coe Manufacturing Company, Painesville, Ohio, known throughout the paper industry for the manufacture of insulation board driers, have developed a radically different type of paper machine drainage system. This system has been in the process of development for a number of years, but it has not been until recently that any large number of systems have been sold.

The underlying principle of operation is thermodynamic rather than mechanical which is the reason



GENERAL VIEW OF PAPER MACHINE EQUIPPED WITH COE DRAINATORS.

for this system being so different from the present conventional systems. It fits in with the most advanced thought in that it provides for the much greater quantities of condensate coming from the wet end driers as compared with those at the dry end. Whereas orifices in the syphon pipes graduated along



ASSEMBLY OF NASH VACUUM AND CENTRIFUGAL PUMPS ON COE DRAINATOR PAPER MACHINE DRAINAGE SYSTEM.

the machine have been frequently used in connection with drainage systems, the Coe system carries this one step further by providing a device which maintains a thermodynamic balance constantly and instantaneously to remove all condensate and air but does not allow the passage of steam. Most remarkable of all is the fact that this is done without the use of any mechanical or moving part.

Naturally, therefore, the system is very simple which means that the maintenance connected with it is practically nil, and on old machines applications are made without costly alterations to existing piping. The adjoining photograph taken in one of the new southern mills gives an idea of the simplicity with which the Drainator units, which regulate the flow from each drier, are fitted to the syphon return pipes.

It is interesting to note that this system had its inception as a result of the Coe Company's efforts to maintain peak production in their large fibreboard and wallboard driers. The complete and thorough elimination of air and condensate is just as essential to the proper operation of these machines as it is to a paper machine.

New Type Water Softener

The Accelator, a new and advanced water softener developed and manufactured by International Filter Company, now is available in a range of capacities to satisfy all requirements. Many larger units have been installed and their advantages thoroughly proved in municipal plants, and now smaller units are offered to afford these same advantages where capacity requirements are less.

Accelator advantages, according to the manufacturers, include more complete and rapid softening of water, lower cost and smaller space requirements than ever were possible with previous methods or facilities. The Accelator is not a mere departure in design. Its underlying principle is an entirely new treating method. Treating chemicals are applied to the water in a new way. Reactions occur under new conditions.

Unlike conventional lime or lime-soda processes, sedimentation is not employed in the Accelator, it is stated. Instead, water is actually squeezed from the top of a recirculated pool of slurry. With this process, means are provided to greatly hasten or accelerate the chemical and physical reactions involved (hence the name "Accelator"). And because of this, space requirements are reduced. This of course brings about a corresponding saving over the cost of treating plants requiring greater area and volume.

Along with the saving in space requirements, the Accelator, through improved conditions for reactions, offers chemical economies and improved, more uniform softening results, it is claimed.

Complete information on the new Accelator for water softening will be found in Bulletin 1820, available upon request from International Filter Co., 59 E. Van Buren street, Chicago, Ill.

SOS Directory for 1939

The 1939 edition of the Source of Supply Directory for paper merchants has been published by the Howard Publishing Company, 2009 Conway building, Chicago. This annual of the paper trade contains an alphabetical list of sources of supply, converting machinery, equipment and supplies, a roster of paper merchants, with lists of manufacturers' representatives, and paper exporters and importers. The price of the book is $2 a copy.

Obituary

John Acer

John H. A. Acer of Montreal, a newsprint manufacturer, died suddenly on February 25, of a heart attack in the Hotel St. Regis, New York, where he had been staying since he came here on business a month ago. He was 62 years old.

Mr. Acer was president and a director of the Dryden Paper Company, Ltd., of Montreal; the Eastern Pulp Company of Canada, Ltd., and Acer, McLernon & Company, Ltd. In 1922 he became chairman of the new board of directors of the Tidewater Paper Mills Sales Corporation, which then bought the Tidewater Paper Mills Company, with headquarters in Bush Terminal Building No. 8, Brooklyn, from The New York Times Company.

Mr. Acer was one of the outstanding figures in the Quebec pulp and paper industry. He had a part in the re-organization of the Dryden Paper Company when it was discharged from receivership in 1928, and became its president.

Later, he became a special partner, with headquarters in Montreal, of Jenks Gwynne & Co., members of the New York Stock Exchange.

Mr. Acer was born in Colborne, Ont. He was a member of several Montreal clubs.

Burial was in Montreal.

Surviving are his widow, the former Miss Louise M. Black; a son, John; two daughters and a sister, Mrs. J. R. McLernon.

Elwell-Parker Bulletins

The Elwell-Parker Electric Company has added two new bulletins, on power industrial trucks, to its technical bulletin file. Bulletin A-8416 covers the type EP-10 low lift platform truck and bulletin A-8459 covers the type ELN-10 high lift platform truck.

Both trucks have rated capacities of 10,000 lbs. and are equipped with the Elwell-Parker k-75 controller which allows for four speeds forward and four reverse and dynamic brakes.

The power plants on the EP-10 and ELN-10 are identical, each being of simple, rugged design and equipped with an Elwell-Parker, 500 per cent overload, heavy duty and high torque motor.

The trail axles are of the rocking type. All steering levers are above axle for greater load clearance and accessibility.

The EP-10 and ELN-10 bulletins also illustrate other types of Elwell-Parkers, viz-fork, combination crane, apron, etc.

Governor Saltonstall to Attend

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 27, 1939—His Excellency Leverett Saltonstall, Governor of the Commonwealth of Massachusetts, is to be the guest of honor at the Fifty-Third Anniversary banquet of the Boston Paper Trade Association, to take place at the Algonquin Club March 15. Vincent Sheean, of Prague and Paris, author of a number of books, will be the speaker. His subject is "Europe after Munich." Three applications for limited membership will be voted on. The banquet will be at 6:30 o'clock and reception at 6.

Indianapolis Market Firmer

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind. February 27, 1939—While there has been little appreciable increase in demand for fine paper during the past week, a firmer undertone to the market is noticeable and local jobbers are of the belief that the February slump is a temporary condition that will be remedied during March. Book prices continue firm following the increase made in January. It is pointed out that while considerable buying preceded the increase in price, that stocks built up at that time are being diminished rapidly and even now are unbalanced and buyers will have to enter the market shortly.

The remainder of the paper market seems to be recovering more rapidly. There appears to be a fair demand for wrapping paper, kraft and bags from the retail trade. Cleaners have begun making inquiries concerning prices for early spring and are expecting a good business. The laundry demand also is fair and likely will become better as spring advances.

Container manufacturers say volume is increasing somewhat. There is a steady demand from the produce and dairy trade and shortly a big increase is expected from the ice cream trade. The box manufacturers have continued during the past fortnight at about the same production pace they have maintained for a month. It is likely that after the first of the month production will be stepped up if for no other reason than to build up warehouse stocks which have been kept at a low point until March 1.

Jobbers now are awaiting the first call of spring for their summer specialties. During the entire winter there has been a good and continued demand for paper towels, cups and napkins, fully as large as the same period a year ago, but with the first hint of spring the jobbers are expecting retailers to come into the market for plates and all the other summer merchandise. Tissues are moving in fair volume.

New Manual on Water Analysis

Men engaged in analytical work or water conditioning in their plants will find a wealth of valuable information in the new, enlarged, fourth edition of the Water Analysis Manual, recently published by the Betz Laboratories.

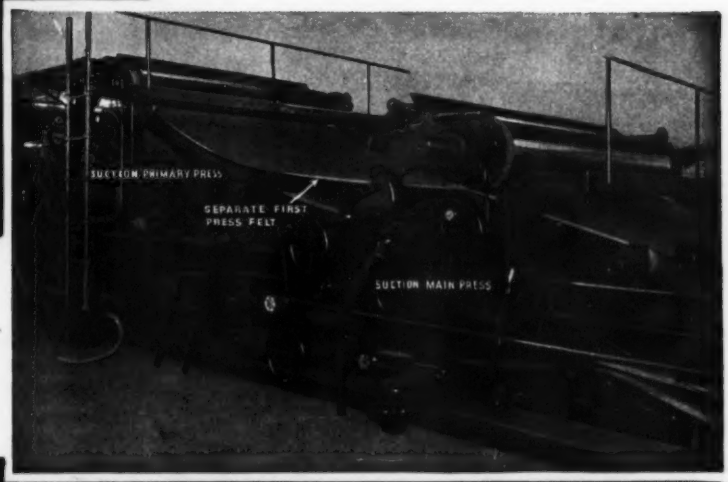
This handbook contains complete, up-to-the-minute facts on water analysis by outstanding authorities. Tells how to obtain representative sample and follows through with correct procedure and calculation of results for each test. Chemicals required are also enumerated and apparatus is illustrated. In addition to various standard tests, several new methods of analyses are described, including the T H Q and Betz-Hellige methods for sulfate determination.

The Betz Water Analysis Manual has been adopted by many concerns as a standard reference book. Enlarged, well illustrated, containing 20 pages and over 10,000 words, this new edition will be mailed without cost or obligation if request is made on company letterhead to W. H. & L. D. Betz, Chemical Engineers and Consultants on all water problems, 235 W. Wyoming Avenue, Philadelphia, Pa.

Suctionize

YOUR BOARD MACHINE WITH Beloit SUCTION

DRUM PRESS *
PRIMARY PRESS
MAIN PRESS



Note the short top felt for suction drum press nip. All plain primaries have been removed.

Wet pickup felt returns after suction primary press. Suction first press is on separate felt.

1. Removes large quantity water without disturbing formation or finish.
2. Reduces crushing and checking.
3. Improves finish. Reduces felt marks.
4. Permits use of light weight short top felt. Lower felt cost.
5. Eliminates several nips. Improves test of board.
6. Permits more bulk if desired.
7. Increases test or permits cheaper furnish and maintain same test.
8. Suction main press more efficient on separate felt.

* Suction drum press is equivalent to suction drum and suction primary press.

BELOIT IRON WORKS PAPER MACH'Y BELOIT WIS.

THE BELOIT WAY IS THE MODERN WAY

BELOIT IRON WORKS, BELOIT, WIS.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

Franklin, Va.—The Chesapeake-Camp Corporation, manufacturer of kraft wrapping, liner and kindred paper stocks, has plans for two additions to mill for expansion in recovery and pulp wood divisions, respectively. Work will consist of a structure 50 x 70 feet, and 80 feet high, to be equipped for the recovery department, and another one-story structure for other purpose noted. Entire project is reported to cost in excess of $200,000, including equipment. Work is scheduled to begin at once. It is understood that project will be carried out under separate contracts for different features of construction.

Neenah, Wis.—The Bergstrom Paper Company, West Wisconsin avenue, manufacturer of book and catalog papers, and allied stocks, has approved plans for a new filter and purification plant at mill, consisting of a reinforced-concrete building, about 50 x 70 feet. General contract has been awarded to the Fluor Brothers Construction Company, 48 Otter street, Oshkosh, Wis., and work will be placed under way at once. Contracts for equipment are scheduled to be made at once. Orbison & Orbison, 206 West College avenue, Appleton, Wis., are consulting engineers.

Jamestown, N. Y.—The Jamestown Container Corporation, recently organized, proposes to operate a plant at Falconer, near Jamestown, for the manufacture of corrugated and other paper board containers for shipping service. New Company is capitalized at 200 shares of stock, no par value, and is represented by Kenneth T. Johnson, Jamestown, attorney.

Kalamazoo, Mich.—The Kalamazoo Wax Paper Products Company, Parsons street, manufacturer of waxed and other processed paper stocks, is consider-

"NON-USERS ARE THE LOSERS"

FINISH AND TRIM

TENAX FELTS

Satisfaction Assured

When the makeready is completed, and the test sheets all approved. what a satisfaction it is to know that your efficient paper-making machine is clothed with a TENAX FELT,—chosen for its long record of DURABILITY and DEPENDABILITY combined with LOW COST per produced ton.

"Non-Users Are The Losers"

LOCKPORT FELT COMPANY

NEWFANE, N. Y.–U. S. A.

ing preliminary plans for a new plant unit, to be located on site in vicinity of present mill, or on other local site to be selected. New building will be designed for considerable increase in present capacity. Estimates of cost and details will be determined at early date.

Kimberly, Wis.—The Kimberly-Clark Corporation, North Commercial street, Neenah, Wis., manufacturer of cover paper stocks, wall papers, etc., will build new addition to Kimberly and not at Neenah, as recently noted in these columns. New structure will be one-story, 41 x 145 feet, and will be used for general shop service, as previously noted. Erection contract has been awarded to the Koepke Construction Company, Appleton, Wis., and work will be placed under way at once. Structure is reported to cost over $50,000, including equipment.

Los Angeles, Cal.—The Eastman Kodak Company, Koda'c Park, Rochester, N. Y., manufacturer of photographic papers and allied products, has approved plans for new branch processing plant at 1013 North Las Palmas avenue, Los Angeles, where site has been selected. New plant will be two-story and basement, 55 x 132 feet, and is estimated to cost approximately $150,000, with equipment. Erection contract has been awarded to H. A. McMurphy, 6347 Eleanor avenue, Los Angeles, and work will be placed under way in March. W. E. Wilson, 5655 Wilshire boulevard, Los Angeles, is engineer.

Brooklyn, N. Y.—The Murray Paper Company, 5414 Sixteenth avenue, wholesale paper goods, has leased a floor and basement in building at 51 Church avenue, and will occupy for storage, distribution and company headquarters.

Kalamazoo, Mich.—The Sutherland Paper Company, manufacturer of box board, paper board, coated paper products, etc., has work in progress on installation of equipment in new addition to mill, previously referred to in these columns, to be used as a paper-converting unit for production of finished paper board specialties, including paper plates, pails, etc. Orders have been placed for machinery to develop large capacity, said to represent an investment of approximately $200,000. It is proposed to have the division ready for operation about the middle of April. Company is now giving employment to 1347 persons in different departments of mill, and said to represent an all-time peak in number of operatives at plant.

Appleton, Wis.—The Consolidated Water Power and Paper Company, Interlake Pulp and Paper Division, East John street, is planning early construction of a new treatment plant for waste sulphite liquor at mill. The work has been directed by the State Water Commission on Pollution, as well as the State Board of Health. Detailed plans for unit will be completed at early date.

Camas, Wash.—The Crown-Willamette Paper Company, Camas, is said to be arranging early call for bids on general erection contract for new addition to mill, to be equipped for laboratory service, as recently noted in these columns. Structure will be one-story, 44 x 120 feet, and will have two laboratory rooms, instrument department, humidity control division, photographic dark room and other technical departments. It is reported to cost about $50,000, including equipment. Company is a unit of Crown-Zellerbach Corporation, 343 Sansome street, San Francisco, Cal.

UNITED PIGMENTS
Pure Titanium Dioxide
UNITANE-O

A brilliantly WHITE, pure titanium dioxide possessing excellent . . .

• OPACITY
• BRIGHTNESS
• DISPERSION

Suitable for ALL types of paper ranging from thin printing papers and waxing tissues to coated book and magazine stocks.

UNITANE O—110 was especially developed for paper pigmentation. Its excellent dispersion in water promotes good retention and excellent sheet formation. As a component of the beater furnish, it produces *whiter* sheets of *great brilliance*, and superior printing qualities.

SAMPLES of UNITANE O-110 will be sent promptly upon request.

UNITED COLORS & PIGMENTS

UNITED COLOR AND PIGMENT CO.
DIVISION OF INTERCHEMICAL CORPORATION
NEWARK, NEW JERSEY
SALES OFFICES IN PRINCIPAL CITIES

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Ronald G. Macdonald
Editor Technical Section

Lynne M. Lamm
Washington Correspondent

Vol. CVIII New York, March 2, 1939 No. 9

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION, Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION, Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

FIRST ANNUAL SOUTHERN PAPER FESTIVAL, Savannah, Ga. April 16-19.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Syracuse Hotel, Syracuse, N. Y., September 12-14.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Atlantic City, N. J. October 16-20.

TAXES AND PROSPERITY

With industry currently operating far below capacity and with vast sums of money idle, the problem of today is how to put this money to work to expand productivity and to provide greater employment. In terms of national income produced, we have slipped back some fourteen years. In 1924, for example, the national income was, in round numbers, $60,000,000,000 and the income of agriculture was $8,000,000,000, while the number of unemployed was under 900,000. In 1938, the national income was $60,000,000,000, the income of agriculture was $6,000,000,000 and the estimate of unemployment was more than 10,000,000.

But the earlier year is comparable with the previous year and with the present one in only one particular, that of the total national income produced. In 1924, the population of this country was 105,710,620, and today it is more than 130,000,000. In 1924, the Federal Debt was $22,350,000,000; in 1937 it was $36,427,000,000, or an increase per capita from $242.68 to $281.82, and still headed upward. In 1929, with a national income of $81,128,000,000, taxes amounted to 12 per cent of national income; in 1937 with a national income of $69,817,000,000, the per cent of taxes to national income had increased to over 17.5 per cent. As our population increased to provide larger markets for our products the highest measure of prosperity we have ever reached was in 1929. Today, we are back to 1924 despite the remarkable technological progress achieved in the last fourteen years.

The reason for this recession of prosperity at a period when so many factors are favorable for the attainment of a higher national income and a fuller measure of prosperity, is due in part to the unfavorable world-wide economic and political situation, but in greater part the deplorable domestic economic situation may be attributed to mistakes in the policies of Federal Government. The failure of the Federal Reserve of a former Administration to check inflation in the reckless use of credit, and the theoretical experiments leading to the practical failure in the monetary and fiscal policies of the present Administration, may be mentioned as the principal governmental errors which have contributed largely to the current depressed state of industry and agriculture.

The situation today is so serious that President Roosevelt has expressed a desire to cooperate with business in an attempt to solve the problem of labor and employment. The assurances of Secretary Hopkins are encouraging but it is difficult to understand how much can be accomplished under the Administration's present policies. Promises are less assuring than appropriate action. Unfortunately, investors and business men lack confidence in the policies of this Administration. A brief historical reference will provide an example of how confidence waned as Government activity increased. In 1932, when the Reconstruction Finance Corporation was established by Act of Congress, the Government entered into the investment business. During the nine years the Federal Government has directed the investment of nearly $25,000,000,000. In that period, investment in private corporations and foreign securities declined from approximately $10,000,000,000 annually, to a low of under $500,000,000 in 1932 and up to about $2,000,000,000 in 1938. In short, as Government spending increased, industrial activity and private investments declined. As a result of the prodigious outpouring of public funds and an ever widening gap between expenditures and income, confidence has been impaired in the policies of the Administration. A sound fiscal policy and less government interference with business would restore confidence.

The new restriction imposed upon private investment by SEC regulations, the various restrictions, such as the Wage Hour Act, Social Security Act and other forms of taxation has throttled business down to a comparatively low level of activity. Providing prevailing Government policies remain unchanged, it is not clear how private enterprise can expand in any substantial manner.

Another tax which exerts a deflationary influence is unemployment insurance. As originally advanced, unemployment insurance represented a means of dealing with temporary unemployment due to seasonal factors, and to moderate swings in the business cycle. The theory was that as industrial activity declined and workers lost their jobs, unemployment benefits would contribute to their income and serve

as a cushioning effect. The result has failed to support the theory. The official report of the Treasury shows that the assets in the unemployment trust funds of individual States increased from $883,763,000 on June 30, 1938, to $1,098,562,000 on January 31, 1939. The figures indicate that pay-roll taxes to support the unemployment insurance plan withdrew $214,799,000 more dollars out of the purchasing power of the nation than was paid out in benefits during the seven depression months.

In the opinion of Walter D. Fuller, president, The Curtis Publishing Company, the present heavy tax burden is a penalty on employment. In an address before the Pennsylvania State Chamber of Commerce, Mr. Fuller said that since 1930, "the fact is that taxation has so subtracted from purchasing power, so destroyed employment power, that we have had the longest and most severe depression in all history. It is taxation which furnishes one of the main answers to why we still are not much nearer to normal conditions in this country than we were in 1930."

To Control Water Pollution

WASHINGTON, D. C., March 1, 1939—The paper industry has shown considerable interest in the question of water pollution and in this connection the Senate Commerce Committee last week made a favorable report on the bill of Senator Barkley to create a division of water pollution control in the United States Public Health Service and to provide it with a $1,000,000-fund annually.

States, cities and other agencies would receive loans or grants for projects intended to end stream contamination.

Representative Mansfield, Democrat of Texas, chairman of the House Rivers and Harbors Committee, has introduced a bill to provide such loans and grants.

The measure would authorize an appropriation of $700,000, to be expended under supervision of the Public Health Service, for surveys of water pollution problems during the next year. It also would provide for grants to States, not exceeding 30 per cent of the estimated cost of projects, and for loans repayable in 30 years at 4 per cent interest.

Five per cent loans would be made, under certain circumstances, to private industries seeking to clean up streams.

The total of loans and grants could not exceed $50,000,000 in any one year.

Representative Mansfield said he introduced the bill at the request of the National Resources Committee, which recently made a study of pollution problems.

P. H. Goldsmith, Pusey & Jones Corp.

The Pusey & Jones Corporation, Wilmington, Del., announces the addition to its staff of Philip H. Goldsmith as sales and development engineer. The company hopes that members of the paper industry will feel free to avail themselves of Mr. Goldsmith's services especially in connection with cylinder machine problems.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1939	1938	1937	1936	1935	1934
January	77.1%	63.9%	90.3%	76.1%	65.8%	.....
February	.....	68.7%	90.1%	77.9%	70.0%	.....
March	.....	69.6%	90.3%	76.0%	70.5%	.....
April	.....	68.3%	92.1%	82.3%	70.0%	.....
May	.....	69.0%	90.6%	81.6%	69.4%	.....
June	.....	66.0%	87.3%	80.7%	72.3%	.....
July	.....	72.0%	81.8%	77.3%	64.9%	.....
August	.....	77.2%	82.9%	81.5%	70.9%	.....
September	.....	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average...	.....	72.3%	80.6%	81.3%	70.5%	.....
First 7 weeks...	78.8%	65.6%	90.0%	76.7%	67.1%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

Current Weeks, 1939		Corresponding Weeks, 1938	
January 14	80.2%	January 15	62.3%
January 21	77.9%	January 22	66.0%
January 28	80.7%	January 29	68.1%
February 4	80.8%	February 5	67.1%
February 11	82.1%	February 12	68.0%
February 18	81.1%	February 19	68.4%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	Jan. 14, 1939	Jan. 21, 1939	Jan. 28, 1939	Feb. 4, 1939	Feb. 11, 1939	Feb. 18, 1939
0% to 50%	64	64	69	54	48	37
51% to 100%	242	242	233	238	237	153
Total Mills Reporting..	306	306	302	292	285	190

PAPERBOARD OPERATING RATIOS*

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association:

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1935	62%	68%	68%	63%	61%	66%	62%
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1935	67%	71%	77%	71%	61%	66%
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%

Week end. Jan. 14, 1939—62%
Week end. Jan. 21, 1939—65%
Week end. Jan. 28, 1939—68%
Week end. Feb. 4, 1939—66%
Week end. Feb. 11, 1939—69%
Week end. Feb. 18, 1939—67%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

* Monthly ratios revised February 16, 1939.

Australia Expands Board Production

With one new plant already in operation and another expected to start in the latter half of 1939, Australia is believed to be reaching a stage of manufacturing its entire requirements of insulating board and wall board, according to a report to the Department of Commerce from the office of the American Commercial Attache at Sydney.

According to an agreement between the two companies, one of them will establish a sales organization to handle the marketing and distribution of the products of both factories. They plan an output of 30,000,000 feet of insulating board per annum. Equipment for the new plant, valued at approximately $320,000, will be imported from the United States, the report stated.

Officials of the local companies hope to make arrangements with the Australian government to allow the American machinery to enter duty free. The machinery is expected to arrive early in 1939.

Select GRINNELL WELDING FITTINGS

. . . Eliminate 8 Problems of Welding and Operation

THIS WELDER meets no complicated problems in building an accurate sub-assembly from seamless pipe and fittings . . . for these are Grinnell Welding Fittings. . . . Four points of welding trouble are *engineered out* in their construction: Their ends match up to standard weight, extra strong or O.D. pipe. They weld easily; their properties are identical with those of seamless pipe. Their welding faces are properly scarfed—45°. Only plain circumferential butt welds are required to join them . . . the easiest of all welds to make.

THIS ENGINEER knows that Grinnell Welding Fittings represent strong links in his piping system, on four counts: Their strength, that results from the seamless pipe or tubing used in their construction, and from their full or greater thicknesses on run or outlet. Their smooth inside and outside surfaces make for free flow through the system. The working pressure-temperature ratings of Grinnell Welding Fittings are identical with those of seamless pipe.

Specify Grinnell Welding Fittings and gain these 8 advantages in your piping system. Catalog 3 gives full details and specifications. Grinnell Company, Inc., Executive Offices, Providence, Rhode Island. Branch offices in principal cities.

WELDING FITTINGS BY **GRINNELL**

WHENEVER **PIPING** IS INVOLVED

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald. Secretary

Silver-Tarnishing Test of Paper*

This method is designed to determine the presence or absence of materials which will tarnish or stain silver in paper used for wrapping silverware. It is chiefly intended for testing tissue papers which, in use, are in direct contact with silverware. Certain types of paper, such as parchmentized, water-repellent types, and metal-coated papers, may require modification of the test procedure. (See Note 3 under Procedure.) The test results indicate the type of tarnish or stain, and the relative distribution of the materials causing such tarnishing or staining.

Apparatus

The special apparatus consists of:

(1) Flat plates 6 x 6 in., cut from commercial rolled sheet brass 0.25 in. thick. One 6 x 6 in. flat surface of each plate should be buffed smooth and as free as possible from tool marks and then plated with pure silver to a thickness of about 0.005 in., buffed again, and plated with another 0.005 in. of silver. In this way a smooth, continuous layer of pure silver about 0.010 in. thick will be obtained which can be cleaned and polished repeatedly. It is advisable to check the amount of silver by weighing the brass plates before and after plating. A layer of silver 0.010 in. thick should weigh 0.056 oz. Troy (1.73 grams) per sq. in.

Note: If the brass plates are plated with pure silver on both sides, one side of each plate will serve as a "blank" during the test and will indicate whether the air in the oven will tarinsh silver or not. The use of plates coated on both sides with silver will obviate the use of the extra strips of silver foil called for in Note 1 under Procedure.

Two plates as described above are needed for each test and are probably sufficient for occasional tests of paper. A number of sets are necessary where frequent routine testing is desired.

(2) A good grade of silver polishing powder or paste which will not scratch pure silver and contains no cyanides. A paste made up of the finest grade of Tripoli powder, such as used for polishing metals for metallographic work, and distilled water containing a small amount of NH_4OH will clean silver completely.

(3) A temperature-controlled air oven or cabinet, protected from access to laboratory fumes.

Test Specimen

Sufficient test specimens, each 6.5 in. square, shall be cut from the paper being evaluated so as to be representative of it. Five specimens are recommended wherever possible.

Note: The sample for test and the cut specimens should be protected at all times from contamination. They should not be handled with bare hands. Use metal forceps.

Procedure

Thoroughly clean the silver surface of each plate and polish it to a high luster, free from grease, then rinse the plate with alcohol followed by ether and dry. Holding one of the 6.5 in. square test pieces by means of paper clips or forceps, wet it with distilled water as even and as uniformly as possible, so that the paper is saturated but not dripping wet. This can be readily done by means of an all-glass atomizer operated by compressed air (not a rubber bulb) or by steaming over the outlet of a wash bottle containing boiling distilled water. As soon as the test piece of paper is saturated with water, place it on the polished silver surface of one brass plate, taking care to have as few wrinkles or air bubbles as possible. Then lay the other brass plate, silver surface down, upon the paper. Place the test assembly in the air oven or cabinet and adjust the temperature so that the paper will dry completely in not less than 3 hours (150 to 170° F. is usually sufficient. See Note 1). When the paper is dry, examine the silvered surface of each plate for evidences of tarnishing or staining. Note the color, and character of any stains found. If isolated spotting occurs, estimate the approximate size of the spots and count their number on each plate.

Report

The report shall state:

1. The number of specimens tested.
2. The color and character of tarnishing or staining, if any (whether spots, large areas, etc.).

Notes

(1) Wherever doubt regarding the presence of sulphur compounds in the air in the oven exists it is advisable to hang 1 or more small strips of clean, highly polished, pure silver foil, in the oven while the test specimens are there. If tarnishing or staining of these strips occurs, the air entering the oven should be purified, or the oven should be set up where the air causes no tarnishing of the silver.

(2) Cardboard and papers other than tissue require a rather long time to dry throughout, in this test. Cardboard of ⅛ to ¼ inch thick may require 48 hours or more to dry throughout. Therefore these types should not be too wet when placed between the test plates. If cardboard is dried too rapidly it frequently buckles sufficiently to lift the test plates out of contact with most of the test specimen. Therefore, when testing cardboard it may be necessary to clamp the test plates together with "C" clamps after inserting the wetted test specimen between them.

(3) Parchmentized, glassine and other water-repellent papers, and metal-coated papers will require certain modifications of the test procedure. In most cases they may be tested without wetting the test specimen and prolonging the time in contact with the silver to at least 24 hours. When such types of paper are tested, the report should state any modification in the procedure which is used.

* TAPPI Tentative Standard T444m-39 (January, 1938). Criticisms and suggestions are welcome and should be sent to R. G. Macdonald, 122 East 42nd Street, New York, N. Y.

3. The number of tarnished or stained areas as maximum and minimum number found in any one test piece and the total number found in all pieces tested.

Additional Information

The principles of this test method are also suggested for use where wrapping paper is to be tested for its staining or corrosion properties with respect to other metals, as steel, copper, nickel, etc. In such cases it is necessary to use plates or forms of the particular metal or alloys in question, and to make such modifications as may be required for the particular purpose. For example, in the case of a metal that would rust, such as steel, the paper obviously could not be wetted; it would be necessary instead to heat in an atmosphere of high humidity.

See also T 406 m-39, Reducible Sulphur in Paper.

Reducible Sulphur in Paper*

This method is designed to determine the total amount of reducible sulphur in paper. It is not suitable in all cases for determining whether a given paper will tarnish silverware. Paper which, when tested by this method, shows less than 0.0008 per cent reducible sulphur, can probably be assumed to be non-tarnishing as far as sulphur is concerned. Results of more than 0.0008 per cent do not necessarily indicate that the paper will cause tarnishing. Likewise, this method gives no information regarding the distribution of the sulphur in the paper, nor any information relative to other materials in paper which may stain silver. When results of more than 0.0008 per cent reducible sulphur are obtained, or information regarding the distribution of the sulphur or the presence of other materials causing stains on silver, is desired, the paper should be evaluated by an accelerated tarnishing test. (See T 444m.-39.)

Apparatus

The special apparatus required consists of a 500-cc., round-bottomed flask having a neck 5 cm. (2 in.) long and 2.5 cm. inside diameter, with a flange about 6 mm. (0.25 in.) wide, ground flat, on the mouth; and a glass tube 10 cm. long and 2.5 cm. inside diameter, with a flange 6 mm. wide, ground flat, on one end of the tube. The apparatus should have means for holding the flanges together with a disc of filter paper between them, so that all gases generated in the flask will pass through the filter paper and then out through the tube. A convenient form of clamp, which can be readily made from pure sheet lead about 6 mm. thick, and the manner of using it, is shown in Fig. 1.

A 1-cc. burette, graduated in 0.01-cc. divisions, is also required.

The balance used for weighing shall be sensitive to 1 mg.

Reagents

(1) Aluminum foil, not over 0.01 in. thick, of highest purity. (Aluminum Company of America's grade 2 S is recommended).

(2) C.P. Conc. (85 per cent) Phosphoric acid (Sp. Gr. 1.7).

(3) C.P. Sodium thiosulphate, 0.001 per cent solution, freshly prepared. Solutions over 2 days old should not be used. Use recently boiled distilled water, cooled to about 20 deg. C., for preparing the solution. Dissolve 0.157 gram of fresh, clean crystals of $Na_2S_2O_3.5\ H_2O$ in a little water in a 100-cc. volumetric flask, dilute to the mark and mix thoroughly; then dilute 10 cc. of this solution to 1 liter and mix thoroughly.

(4) C.P. lead acetate, 10% solution.

(5) Sulphur-free surgical absorbent cotton, prepared by boiling it in a 5 per cent solution of NaOH for about 10 minutes, washing thoroughly with distilled water and drying. The prepared cotton should be stored in clean, glass-stoppered bottles, protected from laboratory fumes, and should not be handled with the hands.

Test Specimen

The test specimen shall consist of 0.25 gram of air-dry paper, made up of pieces about 6 mm. (0.25 in.) square, cut from the sample under test so as to be representative of it.

Note. The sample for test and the test specimen shall be handled with clean forceps only.

Procedure

Transfer the weighed specimen by means of forceps to the flasks. Add 20 cc. of distilled water, and if the specimen has not been previously disintegrated, macerate it by means of a clean glass stirring rod until the paper is well softened and disintegrated. Wash down the glass rod with not over 2 cc. of distilled water. Then add to the flask and contents, 2 grams of aluminum-foil, cut into small pieces, and 10 cc. of conc. H_3PO_4. Insert in the neck of the flask a loose wad of the prepared surgical absorbent cotton about 4 cm. (1.5 in.) long. Clamp between the mouth of the flask and flanged end of the tube a hardened filter paper, such as Schleicher & Schull's No. 575, which has been freshly moistened with 10 per cent lead acetate solution and pressed between dry filter papers, and place another wad of the prepared absorbent cotton in the tube above the paper.

Prepare "standard" flasks under duplicate conditions, containing in place of the paper under test, pure, sulphur-free cotton and measured amounts of the 0.001 per cent $Na_2S_2O_3$ solution. As 1 cc. of this solution contains the equivalent of 0.001 per cent S in 0.25 gram of the sample of paper, the series of flasks should contain multiples of this value. Six

* TAPPI Revised Standard T406m-39 (Official Standard, July, 1936). (Corrected September 15, 1936).

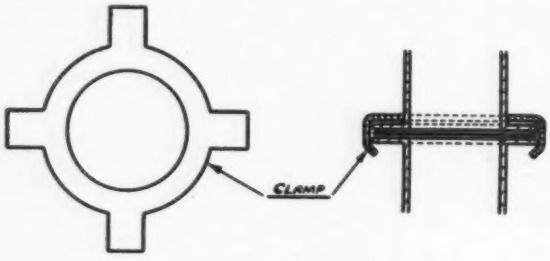


FIG. 1.

flasks, to which have been added respectively 0.1, 0.2, 0.4, 0.6, 0.8 and 1.0 cc. of the thiosulphate solution will give a range suitable for most papers. The thiosulphate solution should be measured with the 1-cc. burette.

Note. Whenever doubt about the absence of sulphur in any of the chemicals or materials used in this test exists, a "blank" flask, containing only the same amounts of water, acid, cotton, and Al as used in the regular procedure, should be included and any sulphur found should be deducted from the test-specimen result. It is advisable to run one or more blanks on each new lot of chemicals, Al, or cotton used.

Set all the flasks in a steam bath for 1 hour, frequently agitating the contents; then remove the filter papers and let them air-dry, protected from laboratory fumes.

The amount of reducible sulphur is found by comparing the stained filter papers. It is assumed to be the same as that of the "standard" flask whose paper most nearly matches in color the paper of the flask containing the test specimen.

Report

The amount of reducible sulphur shall be reported as a percentage by weight of the air-dry paper.

REFERENCES

Schere, P. C., and Sweet, W. W., "Quantitative Estimation of Minute Quantities of Reducible Sulphur", *Ind. Eng. Chem., Anal. Ed.*, 4, 103 (1932).

Lachelle, C. E., "Determination of Minute Quantities of Sulphide Sulphur", *Ind. Eng. Chem., Anal. Ed.*, 6, 200 (1934).

Edwin Sutermeister, "Chemistry of Pulp and Paper Making", 2nd Ed. p. 422. New York, John Wiley & Sons, 1929.

Review Of Paper Industry Literature

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C. for 10 cents each. Send currency, not stamps.

Raw Materials

Surface-Bound Versus Capillary-Bound Water in Wood. Alfred J. Stamm and L. A. Hansen. J. Phys. Chem. 42:209-214 (1938).—By the surface-bound or adsorbed water is understood that water which does not act as a solvent. Thin sections of sugar pine about 1 mm. in the fiber direction were specially extracted with benzene, methanol and water. A vacuum drier similar to that of Barkas (*Proc. Phys. Soc.* (*London*) 48:1-17 (1936)) was used for removing air from the wood (to eliminate capillary condensation) and running the solution over the wood without loss of solvent. Preliminary experiments indicated that water is selectively adsorbed from aqueous solutions that cause no appreciable swelling of the wood beyond its water-swollen dimensions; the solute is selectively adsorbed from solutions that produce appreciable swelling. The solutions of sucrose, glycerol and sodium chloride used belong to the first class. Changes in concentration of the solutions due to adsorption by the wood sections placed in them were measured by the use of Hilger-Raleigh gas cell interferometer adapted for use as a liquid instrument. The selective adsorption of water from aqueous solutions is a function of the activity rather than the concentration of the water in the solutions. When the percentage of water adsorbed by the wood was plotted against the equilibrium vapor pressure of the solution it was found that an equilibrium value of about 3 per cent was approached in equilibrium with vapor pressure reductions exceeding 25 per cent, which presumably is the adsorption value free from residual, capillary condensation and non-equilibrium effects. The results indicate that measurement such as those of Barkas in solutions producing only slight depressions of the vapor pressure (less than 25) do not measure the true surface-bound water. The value of 3 per cent here obtained is only half the predicted value. A possible explanation for the discrepancy is that the water acts partially as solvent, sharing its bonds equally between wood and solute.—A.P.-C.

Composition of "Udonoki" and "Tsuge" Woods. I. Miura. J. Cellulose Inst. Tokyo, 13:494-495 (1937).—Results of chemical analysis of "Udonoki" (*Pisonia umbeldifera*, Nyct) from the Tenian Island are compared with those of *Calpidia Nishimurae*, Rehd et Wils, from the Bonin Islands. Both woods are very soft and contain a very high per cent of ash. The former, compared with semi-tropical hardwoods, has a very high lignin content and water extract, and gives a low yield of low-alpha-cellulose pulp. The latter in these respects is slightly superior to Udonoki, with the exception that the water extract is very high. "Tsuge" (*Buxus japnonica*) is very hard, and in most of its chemical properties it is slightly superior to Udonoki. Its ash and water extracts are smaller than those of either of the other woods.—A.P.-C.

Comparative Values of Newfoundland Spruce and Fir and Russian Spruce As Sources of Paper Pulp. Anon. Bull. Imp. Inst. 36: 18-25 (1938).—There is no great difference in the resin content (ether extract) of the three woods; Newfoundland fir furnished rather more resinous material soluble in a 1:2 alcohol-benzene mixture than the spruces, due largely to the presence in the fir of knots which are richer in resin than the knot-free wood. In commercial practice these knots are largely removed in the screening of the chips. The decreasing order of density was: Newfoundland spruce, Russian spruce, Newfoundland fir. By the soda process, the Newfoundland fir and spruce gave similar yields of unbleached and bleached pulp which were slightly higher than that obtained from the Russian spruce. For the production of soda pulp the Newfoundland fir and Newfoundland spruce do not seem to require different treatment and could accordingly be used together. All three woods furnished satisfactory amounts of sulphite pulp, though the yield from the fir was a little lower than that from the two spruces. —A.P.-C.

Alder Wood As a Paper Making Material. Anon. Bull. Imp. Inst. 36:26-30 (1938).—Welsh alder wood will give, by the soda process, an unbleached pulp suitable for use in the manufacture of wrapping papers either alone or, where greater strength is required, in admixture with stronger pulps. This wood can be cooked to give a pulp which will bleach to a satisfactory whiteness and which would be suitable for the uses for which bleached soda pulps are normally employed. Comparatively to commercially available soda pulps, alder pulp has shorter fiber length. The yield of bleached pulp is somewhat less than 44 per cent on the dry basis. Cost and supply

considerations would probably preclude Welsh alder wood being used as a commercial source of paper pulp.—A.P.-C.

Quick Growing Poplar Hybrids. Helge Rost. Wochbl. Papierfabr. 69, No. 13:276-77 (March 26, 1938).—Advantages of the hybrid over the parent trees are enumerated; such as, longer fibers, quicker growth, greater yield and more resistant to diseases. The fiber length of populus tremuloides is 1.16 mm. while that of the hybrid poplar is 1.40 to 1.75 mm. Methods of propagation are described.—J. F. O.

Composition of Straw, Bran and Other Lignified Vegetable Tissues. Gabriel Bertrand and Georges Brooks. Compt. Rend. Acad. Agr. France 24:191-193 (1938).—Previous work has been extended to include straws, fibers, bran and some cellulose fibers (flax, ramie and cotton). Boiling these materials with water containing 2 per cent of sulphuric acid forms a certain quantity of reducing sugars principally xylose. These materials are a ready source of xylose which is readily transformed into furfural for which many industrial uses have been found in recent years. The cellulose content of straws is variable.—A.P.-C.

Reeds As a Source of Raw Material. Mirus. Wochbl. Papierfabr. 69, No. 15:321-22 (April 9, 1938).—An appeal to the German paper industry to make an effort to use reeds for the manufacture of paper. The production of reeds per hectar and the tonnage possible are given, as well as a list of articles written on the subject.—J. F. O.

The Working of Old Papers. Wochbl. Papierfabr. 69, No. 11:235-36 (March 12, 1938).—According to the German Four Year Plan, the consumption of old paper must increase from the present 25 per cent to 30 per cent which means an additional use of 150,000 tons of old paper. Kollergangs and de-fiberers are both used for breaking up the old paper, the kollergang is best when heavily sized papers are used. Wet or dry kollering and the weight of the stone are discussed. The use of breaker beaters and whether it will displace kollergangs concludes the article.—J. F. O.

Paper As Filler and Raw Material. Pappen-u. Holzstoff-Ztg. 45, No. 15:166-167 (April 15, 1938); B. I. P. C. 8:402.—Reference is made to different uses of waste paper as filler in floor compositions and as raw material for artificial cork, insulating board, waterproof board, artificial leather, etc. —C. J. W.

Economic Importance of Waste Paper. Z. Papier, Pappe, Zellulose, Holzstoff 56, No. 8:11-12 (April 30, 1938); B. I. P. C. 8:408.—A discussion of the importance of waste paper as a raw material, the methods of collecting and sorting, deinking, etc. —C. J. W.

Cellulose and Lignin

Micellar Structure of Cellulose. O. Kratky and F. Schoszberger. Z. physik. Chem. B 39:145-154 (April, 1938); B. I. P. C. 8:371.—Ramie fibers soaked in gold chloride solution and then exposed to ultraviolet light receive deposits of reduced gold in particles-forming chains of the order of 100 A long, but only one or two atoms broad. Such fibers used in x-ray investigations exhibit an increase in the usual cellulose interference pattern by about 100 per cent and an increase in the intensity of blackening around the central beam of 100-200 per cent. This change is reversed by dissolving out the gold. The data are interpreted in terms of a periodicity in the structure of the cellulose fiber.—C. J. W.

End Group of Cellulose in Cotton Hairs. II. Erich Leckzyck. Ber. 71, No. 4:829-841 (April 6, 1938); B. I. P. C. 8:371.—Alcoholysis of carefully methylated cotton with 42 per cent methoxyl content yields tri- and tetramethyl methylglucoside. In some experiments, however, where no tetramethyl methylglucoside is found, a minimum amount of a compound containing 45 per cent methoxyl is obtained. This compound is unstable toward sodium, and its aqueous solution reacts strongly acid. It seems to be a trimethoxybutanoncarboxylic acid. It is assumed that this compound combines with the cellulose chain, thus masking the end group.—C. J. W.

Highly Polymerized Compounds. 189. The constitution of cellulose. H. Staudinger. Holz, Roh u. Werkstoff 1, No. 7:259-265 (April, 1938); B. I. P. C. 8:371.—There exists not one kind of cellulose but a homologous series of polymers of the same. The physical properties of native and regenerated celluloses depend on the degree of polymerization of their macromolecules and further on their threadlike form. The chemical and physical behavior of cellulose may be explained by a consideration of its macromolecular structure. Lignin, however, is not a highly polymerized substance.—C. J. W.

Decomposition of Various Wood Species and Straw by Means of Alkali and Cuprammonium Hydroxide. Richard S. Hilpert and Werner Hansi. Ber. 71, No. 5:933-937 (May 4, 1938); B. I. P. C. 8:370.—In continuation of their former experiments, the authors treat cypress, straw, alder, and red beech with strong alkali and carbon disulfide. In all cases the material goes into solution leaving a residue of 8 to 16 per cent. From these solutions a part of the dissolved material can be reprecipitated by means of mineral acids. The precipitated material is then further dissolved in Schweizer's reagent and reprecipitated with acids. The residues of the alkali treatment are also partially soluble in Schweizer's reagent and reprecipitable with acids. All the products obtained are analyzed for carbon, hydrogen, nitrogen, and methoxyl content, and from the results it is concluded that cuprammonium is not as harmless a solvent for cellulose as is usually assumed. The analyses further show that only one reaction product insoluble in Schweizer's solution has the chemical composition of cellulose. There is therefore no reason to assume that cellulose with its typical properties is present in wood. —C. J. W.

Decomposition of Straw and Red Beach Wood by Means of Sodium Hypochlorite. Richard S. Hilpert and Georg Hechler. Ber. 71, No. 5:1066-1070 (May 4, 1938); B. I. P. C. 8:370.—Straw and red beech wood are alternately treated with 35 per cent sodium hydroxide, 4 per cent sodium hypochlorite, and 16 per cent sodium hydroxide solutions, and the intermediate and final products are analyzed for carbon, hydrogen, methoxyl, lignin, and pentosan. The products from straw do not show any difference in their carbon and hydrogen content and agree with those of a disaccharide. From beech, products are obtained which on analysis correspond to a triose, but which have also a methoxyl content of 5 per cent, or only 1 per cent lower than that of the original wood. The products from beech still have 14 per cent lignin containing 18 per cent

methoxyl, but only 4 per cent pentosan. From this it is concluded that the methoxyl is partially combined with hexoses, which resinify with mineral acids. The results of these experiments confirm the former conclusion that cellulose is not a component of wood, but is instead a reaction product.—C. J. W.

The Structure of the Products of the Periodic Acid Oxidation of Starch and Cellulose. Ernest L. Jackson and C. S. Hudson. J. Am. Chem. Soc. 60:989-991 (May, 1938).—The hydrolysis of the products of the periodic acid oxidation of cornstarch and cotton cellulose by decinormal aqueous hydrochloric acid at 98° to 99°C. produces glyoxal and *d*-erythrose, which proves that periodic acid breaks the carbon chain of the $C_6H_{10}O_5$ units of starch and cellulose between carbon atoms 2 and 3, and confirms the generally accepted structure of the predominating units in these polysaccharides. The possible presence of other types of units in minor quantities is not excluded by these results.—A.P.-C.

Studies of Cellulose Hydrolysis by Means of Ethyl Mercaptan. II. M. L. Wolfrom, Louis W. Georges and John C. Sowden. J. Am. Chem. Soc. 60:1026-1031 (May, 1938).—The hydrolysis of 5 per cent solutions of cellulose in fuming hydrochloric acid at 16°C. during the first 3 hrs. was studied in some detail, and the optical rotation changes of the cellulose during this time were observed. Mercaptalated products were prepared by treating the cellulose solution at 0°C. with ethyl mercaptan at stated time intervals. The corresponding regenerated hydrolyzed-cellulose products were prepared. Sulphur analytical data indicated that the degree of polymerization of the mercaptalated products varied from 114 to 23 glucose units. The degree of polymerization calculated according to the equation of Kraemer and Lansing, from the cuprammonium viscosity data for both the mercaptalated and non-mercaptalated hydrolyzed celluloses, were in good agreement throughout with those calculated from the sulphur analytical data, except for the very early stages of the hydrolysis, wherein the sulphur data gave lower results. The mercaptalated hydrolyzed celluloses showed a low copper number, varying from 1.8 to 5.5; the non-mercaptalated hydrolyzed celluloses, from 5.0 to 28.4; the copper number ratios for these two series of products showed an apparent regularity. —A.P.-C.

Mechanism of Cellulose Reactions. H. M. Spurlin. Trans. Electrochem. Soc. 73, 13 pp. (preprint) (1938).—A cellulose molecule is, and reacts as, a polytrihydric alcohol, containing one primary and two different secondary hydroxyl groups per unit of polymerization. Reaction may be by disrupting the linkages holding the units together, or it may be any of the usual reactions of hydrozyl groups. The tendency for one hydroxyl of a glucose unit to react before the others is slight in esterification or other reactions in acid medium, but may assume importance in alcoholic reactions, such as xanthation, etherification or oxidation. In most reactions, the distribution of substituents along the cellulose chain is governed by the laws of chance. The reaction of cellulose in the fibrous or other solid state is governed by the rate of diffusion of reagent to the individual hydroxyl groups. This, in turn, is governed by the peculiarities of structure of the fiber and the degree of swelling of the cellulose. Increase of volume due to swelling may proceed to a considerable extent without essential loss of the previous orderly arrangement. The greater the extent of swelling, the greater is the rapidity of reaction; the greater the uniformity of swelling, the greater is the uniformity of reaction.—A.P.-C.

The Swelling of Cellulose as a Function of the Hydrogen-ion Concentration. Maurice Déribéré. Papeterie 60:354-359 (April 25, 1938).—A brief indication of the use to which swelling-pH curves of pulp could be put in the manufacture of paper. —A.P.-C.

Specialties

Thermal Insulation. Frank A. Biederman, assignor to Paper Patents Co. U. S. pat. 2,102,233 (Dec. 14, 1937).—A soft and flexible bat formed of a large number of superposed sheets of very thin creped tissue paper, is enclosed in a casing and an edge of the bat is adhesively secured to the inner side of the casing. (Cl. 154-44).—A.P.-C.

Newsprint and Pulp in the New U. S.-Canada Trade Agreement

MONTREAL, Que., February 28, 1939—In the discussion in the Canadian Parliament on the new trade treaty between the United States and Canada a division of opinion has arisen as to whether or not any value could be attached to the fact that the agreement binds to the free list newsprint and wood pulp imported by the United States from Canada. Opposition members claim that this binding is of no value. D. G. Ross, for instance, said he did not see much concession on the part of the United States, and derided the contention of the Government statement that "The assurance that duties will not be imposed on this huge volume of trade is of great value to Canada and has been taken into consideration by that country in making its concessions to the United States on articles dutiable under the Canadian tariff as well as on duty free articles."

To uphold his contention that keeping newsprint and wood pulp on the free list was "simply a matter of self preservation," he quoted the opinion that "A secondary reason why the United States has kept newsprint paper and paper materials on the free list may lie in the fact that at least in times of active business construction the cut of wood from American forests for lumber, paper and all other purposes, exceeds the annual growth, with resultant depletion of the total stand of timber, logs, posts, poles, railway ties, pickets, palings and lath. The free entry of these wood products has long been maintained by Congress in the public interest."

Hon. T. A. Crerar, Minister of Mines and Resources, replying to these remarks, said: "As regards the great pulp and paper industry of Quebec, we find our present free entry to the United States guaranteed during the term of this agreement, and that is not without some significance. The improvements being made by modern scientific research in the processing of paper will probably lead before very long to the development of methods which will enable newsprint to be made from the great stands of southern pine in the United States, and when we consider that our exports of pulp and paper to that country last year amounted to more than $100,000,000, it is worth something to have during the term of this agreement the assurance that no duty will be placed against our pulp and paper."

Treatment of Tissue Paper. Grover C. Hoffman, assignor of one-half to Helene de Bourgogne. U. S. pat. 2,106,096 (Jan. 18, 1938).—Tissue paper is rendered suitable for use as bed sheets, pillow cases, etc., by saturating with a 2:1:3 ethanol-glycerin-water solution containing in suspension 5.5 oz. of talcum powder per 6 gal. of the solution, then passing the treated paper between press rolls and drying. (Cl. 91-68).—A.P.-C.

Process of Treating Wood Pulp. Harrison R. Williams, assignor to International Paper Company. U. S. pat. 2,110,032 (March 1, 1938).—Wood pulp. after having been disintegrated in water, is rendered porous and full of gas pockets or cavities, which remain in the product even after the latter has been dried, and the material may thereafter be carded to render it more fluffy and porous, whereupon it closely resembles cotton in appearance and texture and is very highly absorbent. It may be rendered more or less moisture-repellent if required. This may conveniently be obtained adding to the beaten pulp at a consistency of about 5 per cent 1 gram per gallon of a 0.1 per cent carbolic acid and 0.1 per cent glycerin solution in rapeseed oil; and as the pulp is flowed into the vat of a cylinder machine to be formed into paper, there is added 1 gram of sodium bicarbonate and 0.5 gram of potassium acid tartrate per gallon of stock. (CL. 154-2). —A.P.-C.

Washing of Sulphate on Rotary Vacuum Filter Presses. I. A. Shkurenko. Bumazhnaya Prom. 15, no. 9:54-65 (1937); C. A. 32:3956.—The performance of the Imperial and Wolf vacuum presses and the measures for preventing the frothing of liquor are discussed.—C.J.W.

Investigations of Papers of the Aztecs of pre-Columbian and Columbian Time and Studies of Chinese, Turkish, Buddhistic, Sogdian and Other Papers from the Turan Findings. Oswald Richter. Faserforschung 13, no. 2:57-81 (March 16, 1938); B. I. P. C. 8:335.—The author reviews briefly the results of his studies which will soon be published in book form. The first part deals with Aztecan papers, in which the author proves that the fibrous portion of *Agave americana* or *mexicana* was also used for papermaking and not only different *Ficus* species ("Amatl"), which formed the most common papermaking material. The second section deals with papers derived from the findings made in Turan. In one rag paper the author detected a large number of down feathers, which had probably been used for decorative purposes on cloths and finally found their way into the papermaker's vat. Most papers, however, were made from mulberry bark, and since Turan was situated on Marco Polo's famous silk road, it is quite likely to assume that the large waste from feeding silk worms was utilized for papermaking. The Aztecan agave papers contained corn and wheat starch as filler and size, the Chinese papers rice and wheat starch, and the Turkish papers a large amount of wheat starch.—C.J.W.

Miscellaneous

Rust Preventatives. Wochbl. Papierfab. 69, no. 7:138; no. 9:184; no. 11:241 (Feb. 12, 26, March 12, 1938); B. I. P. C. 8:329.—Can polished iron or steel sections of machinery be kept rust-free except by greasing them? Apart from sandpapering at regular intervals, protective varnishes or lacquers with cellulose, synthetic resin, or chlorinated rubber base are recommended, eventually applied by the spray method. The metal sections must be perfectly clean and free from oil. Another answer suggests a special paste sold under the trade name M.Z.3-paste, a non-greasy material with which metal sections can be easily cleaned. A protective film is formed upon the polished surfaces which prevents a quick recurrence of rust formation.—C.J.W.

Adhesives

Casein Solution. Carl Iddings, assignor to The Muralo Company, Inc. U. S. pat. 2,090,630 (Aug. 24, 1937).—A casein solution maintaining stability and substantially uniform viscosity over long periods of time is prepared by heating and use of ammonium fluoride or an alkali metal fluoride and has its viscosity adjusted by a liquid lower aliphatic hydrocarbon derivative which may be an alcohol, ether ester or ketone, e.g., acetone or ethylene glycol butyl ether, which has a greater viscosity-reducing effect upon the solution than an equal amount of water and does not impair the stability of the solution. Various other auxiliary ingredients such as sodium fluoride, ammonium fluoride, silica and pine oil may be used. (Cl. 134-12).—A.P.-C.

Plyboard Adhesive. Jordan V. Bauer, assignor to Stein, Hall Manufacturing Co. U. S. pat. 2,102,-937 (Dec. 21, 1937).—By using ungelatinized starch in conjunction with a suitable carrier or suspension medium as an adhesive for corrugated board, it is possible to obtain a bond the equivalent of, or better than, those previously obtained and at a greater rate of speed. The best carrier is a gelatinized starch solution sufficiently modified by oxidizing agents or other means such as partial dextrinization, to bring the viscosity characteristics within the desired range. Certain starches that are naturally less suitable for this purpose (e.g., corn, rice, wheat, sago, etc.) can be adapted to the process by the addition of a small quantity of caustic soda. (Cl. 134-23.4).—A.P.-C.

Casein Glue. Walther Luetzendorf, assignor to I. G. Farbenindustrie A. G. U. S. pat. 2,091,325 (Aug. 31, 1937).—A glue of good stability is formed by decomposing casein with an alkali metal silicate consisting essentially of an alkali metal metasilicate containing alkali metal oxide and silicic acid in the approximate ratio of 1:1 with an admixture of about 10 to 15% of free hydroxide of the alkali metal. (Cl. 134-23.9).—A.P.-C.

Sodium Silicate Adhesives. Arthur S. Wevgandt, assignor to E. I. du Pont de Nemours & Co. U. S. pat. 2,111,131 (March 15, 1938).—From 0.1 to 1.0% of zinc oxide is added to a sodium silicate solution, and the mixture is subjected to elevated temperature and pressure until a homogeneous product is obtained. (Cl. 134-23.92).—A.P.-C.

Caseinate Adhesive Solutions. Wm. H. Nicol, assignor to Wingfoot Corporation. U. S. pat. 2,095,-887 (Oct. 12, 1937).—A method of preparing from dried pieces of casein, caseinate solutions suitable for use in adhesives comprises reducing the casein to particles not larger than 40-mesh, ball milling with about 10 parts of water, for 1 hr. until the mixture assumes a milk-like appearance, then continuing the ball milling with the addition of water and sufficient ammonia to convert the casein into caseinate and continuing the ball milling for about 1 hr. until caseinate is formed. (Cl. 134-23.9).—A.P.-C.

Removal of Iron by Lignin in Water Treatment

By G. H. Nelson, Max Levine, and D. F. J. Lynch [1]

Abstract

Lignin prepared from corn cobs was found to be very efficient for removal of iron as present normally in waters, or water artificially impregnated with iron salts.

Lignin was found to be more effective as an iron-remover than a widely employed inorganic iron-removing compound.

In the range of acidities normally encountered in waters lignin was found to be equally efficient for the removal of ferrous and ferric iron. The inorganic iron-removing compound employed, as a basis for comparison, was more efficient for removal of ferric than ferrous iron.

With two different waters to which ferrous chloride had been added, lignin was found to be equally efficient as an iron-remover whereas the inorganic compound was more efficient with one of these waters than for the other. This would indicate that lignin may have a wider range of application than the presently employed inorganic compound.

The capacity of lignin as an iron-remover was found to be distinctly greater than that of the inorganic compound, as indicated by the fact that the efficiency of the latter dropped precipitously after the sixth reuse, whereas lignin showed no decrease in efficiency even after the tenth reuse.

Introduction

In the course of investigations on the fermentative utilization of farm wastes, it appeared that difficulties, encountered in the chemical determination of lignin and the suppression of anaerobic bacterial fermentation when alkali lignin was added *(14)*, might be associated with chemical reactions of lignin and metallic salts. Studies on lignin reactions disclosed the formation of such lignin metallic salts and led to a series of observations on the efficiency of lignin for removal of metallic elements, particularly iron, from water.

Soil chemists have studied the reactions of organic residues from plant decomposition with the various bases commonly found in water *(15, 16, 17, 18, 21, 27, 28)*. Although these studies were made in connection with soil investigations, they are of general interest in the treatment of water. Many investigators also have proposed the use of residues obtained from the acid treatment of lignite, coal, wood, etc., for treatment of water *(6, 19, 25, 26)*. No attempt is made to cite all of these investigations but the references given are representative of the work reported.

The possibility of utilization of lignin for iron removal appears to be significant and pertinent, both by reason of the fact that the removal of iron from municipal and industrial water supplies is important and because it might afford a means or utilizing at least a part of the lignin now going to waste. The Committee on the Industrial Utilization of Farm Products and By-Products, of the United States Department of Agriculture *(23)*, estimated a potential source of over 33,000,000 tons of dried corn stalks. With a probable lignin content of 20 per cent this would mean over 6,000,000 tons of available material. An equal quantity of lignin would be available from wheat straw, and an additional 2,000,000 tons of lignin has been estimated to be wasted in the sulphite pulp industry *(1)*.

The desirability and necessity for removal of iron from water needs no detailed discussion but it is of interest to note that in municipal supplies it has become the universal practice to remove excess iron because of the unsightly appearance which it imparts to water, the undesirable taste which it produces, the discoloration of clothes in home washings, and its interference with the flow of water through mains *(7)*. In the industrial field, iron removal has been recognized to be important particularly in such processes as commercial laundering *(9)* and the manufacture of dyes *(3)*, textiles, paper *(24)*, ice, foods and various beverages, including beers and carbonated soft drinks.

Among the processes used for iron removal, the following are particularly noteworthy:

1. Aeration followed by sedimentation and filtration
2. Precipitation with lime, alum, soda ash or other coagulants.
3. Passage through a bed of natural or artificial zeolite.
4. Passage through beds of other suitable impregnated materials, minerals or ores.

The utilization of simple aeration and filtration *(2, 13)* has been more successful with waters containing iron in the form of ferrous bicarbonate and less successful for ferrous sulphate, provided the waters are low in organic acid content. Aeration is effected by dropping the water over trays, pumping air through the water, or spraying water into the atmosphere. Aeration is relatively inexpensive but the process is not applicable to acid waters or for some iron salts.

The use of lime *(8)*, soda ash, alum, etc., has been found applicable particularly to waters of the higher acidities and organic content.

The use of zeolite for iron removal *(4, 22, 29)* is increasing and, except for waters that are acid, may be practical for the removal of both the ferric and ferrous forms of iron. However, the use of zeolites is generally more expensive.

More recently, there has been suggested the utilization of such materials as activated carbon, crushed anthracite and sands impregnated with iron and manganese salts, or ores *(5, 11)*, which serve to catalyze the removal of iron *(10, 12)*. The process of back-washing is not as efficient for the natural manganese ores as with the other catalytic iron removers.

[1] Agricultural By-Products Laboratory, Ames, Iowa. Established by the Bureau of Chemistry and Soils, U.S. Department of Agriculture, in cooperation with the Iowa State College.
U.S. Public Service Patent has been applied for.

Preliminary experiments indicated that lignin could be used for iron removal and that the use of this inexpensive agricultural by-product may be more efficient than some of the compounds now used. The following data are presented with a view to bringing the iron-removing properties of lignin to attention.

Experimental

Experiments were carried out to ascertain (a) the relative efficiency of lignin and a commercial inorganic iron-removing compound when added in equal quantities to waters of varying character and iron content, and (b) the capacity of a given quantity of lignin and of the commercial iron-removing agent to continue to function when reused.

The lignin was prepared from corn cobs by a modification of the method described by Phillips *(20)* using 4 per cent alkali. This alkali lignin was further treated with 72 per cent sulphuric acid (15 cc. per gram of lignin), at 15 deg. C. for 16 hours. The mixture was then diluted to 4 per cent acid with distilled water, boiled for two hours, filtered, and the lignin washed free of acid and dried. This dried lignin constituted the product employed for the study of iron removal.

A. Relative Efficiencies of Lignin and a Commercial Iron-Removing Compound.

The technic for ascertaining the relative efficiencies of the lignin and inorganic iron-removing test material was as follows:

Five hundred cubic centimeter portions of water to which had been added the desired quantities of iron-removing agents, (32 to 1000 p.p.m.) were placed in one-liter erlenmeyer flasks, tightly stoppered, and the mixtures were shaken from time to time, for a period of two hours, after which the material was filtered through filter paper. The filtrate was then evaporated to dryness and the amount of iron ascertained by the thiocyanate process according to the procedure described in A.P.H.A. Standard Methods of Water Analysis, 1933. The water samples employed consisted of: (1) distilled water to which ferrous and ferric sulphate had been added; (2) well waters from (a) a shallow well near Ames, (b) the Iowa State College water supply before and after treatment for removal of iron, and (c) water from Madison, Wis. before treatment for iron removal; and (3) Iowa State College and Madison, Wis. water supplies, which had been treated for iron removal, (the former by aeration, alkalinization and filtration, the latter by a zeolitic iron-removal process) to which ferrous and ferric sulphate were added. The results are summarized in Table I.

In the distilled water series to which ferric sulphate was added, the lignin was more efficient than the commercial inorganic compound, while in the ferrous sulphate series no difference was observed under the conditions of this experiment. It should be pointed out that in these series the reactions were extremely acid (pH 3.5 for the ferric and pH 2.5 for the ferrous iron experiments).

In all other series of observations the efficiency of lignin was not appreciably different for the ferrous and the ferric iron, whereas that of the inorganic commercial compound was greater for the removal of ferric than ferrous iron.

Another rather interesting observation was that the use of lignin of more than 64 p.p.m. did not increase its efficiency significantly as an iron-remover, whereas with the inorganic commercial compound the quantity of iron removed was a direct function of the quantity of compound employed. This is very well shown by the results obtained with the Iowa State College pump No. 2 water containing 14.02 p.p.m. of iron. Addition of 64 p.p.m. of lignin reduced the iron concentration to 0.35 p.p.m.; increasing the concentration of lignin, to 125 p.p.m. or more, did not effect further appreciable decreases in the iron content, for even with 1000 p.p.m. there still remained 0.24 p.p.m. of iron. In contrast to this, with 64 p.p.m. of the inorganic iron-removing compound, there was left 6.47 p.p.m. of iron, and the residual iron decreased progressively as the quantities of compound employed was increased but even with a concentration of 1000 p.p.m. there still remained 1.5 p.p.m. of iron.

TABLE I. Comparison of Lignin and Commercial Inorganic Compound for Removing Iron

Test Water	Iron-Removing Agent Employed (in p.p.m.) Initial Iron Concentration: Added As	Total p.p.m.	pH	Test** Material	Iron Remaining in p.p.m. 32	64	125	250	500	1000
Distilled H_2O	$Fe_2(SO_4)_3$ (10 p.p.m.)	10.0	3.5	Lignin	...	...	...	0.40	1.00	0.70
				C.R.*	...	...	...	2.00	1.15	0.20
Distilled H_2O	$FeSO_4$ (12.6 p.p.m.)	12.6	2.5	Lignin	...	...	...	8.00	8.00	7.50
				C.R.*	...	...	...	8.00	10.00	7.50
Shallow Well Ames, Iowa	.....	10.8	7.9	Lignin	0.72	0.45	0.40	0.21	0.17	0.17
				C.R.*	...	5.44	4.00	2.10	0.55	0.25
Iowa State College Pump No. 2 (untreated)	.....	14.02	7.5	Lignin	0.76	0.35	0.25	0.20	0.15	0.24
				C.R.*	...	6.47	4.90	3.60	1.81	1.15
Iowa State College Tap Water (treated)‡	.....	0.34	7.8	Lignin	0.12	0.08	0.07	0.06	0.03	0.02
				C.R.*	...	0.13	0.11	0.10	0.07	0.07
Madison, Wisconsin (untreated)	.....	0.09	7.8	Lignin	0.07	0.05	0.05	0.04	0.04	0.02
				C.R.*	...	0.09	0.06	0.05	0.05	0.03
Madison, Wisconsin (treated)†	$FeCl_2$ (9.12 p.p.m.)	9.16	7.7	Lignin	0.33	0.29	0.16	0.15	0.10	0.10
				C.R.*	...	4.59	3.97	1.30	0.87	0.56
Madison, Wisconsin (treated)†	$FeSO_4$ (11.58 p.p.m.)	11.62	7.7	Lignin	0.47	0.30	0.25	0.20	0.16	0.14
				C.R.*	...	4.40	3.21	2.22	1.06	0.68
Iowa State College Tap Water (treated)‡	$FeCl_3$ (8.91 p.p.m.)	9.21	7.5	Lignin	0.23	0.12	0.09	0.07	0.07	0.09
				C.R.*	...	1.19	1.10	0.87	0.42	0.30
Iowa State College Tap Water (treated)‡	$FeSO_4$ (9.21 p.p.m.)	9.51	6.8	Lignin	0.20	0.17	0.15	0.12	0.12	0.12
				C.R.*	...	1.99	1.20	0.71	0.37	0.21
Iowa State College Tap Water (treated)‡	$Fe_2(SO_4)_3$ (4.85 p.p.m.)	5.15	6.5	Lignin	0.16	0.14	0.11	0.11	0.11	0.11
				C.R.*	...	0.25	0.24	0.22	0.22	0.16

** Iron-Removing Agent.
* Commercial Iron-Removal Compound.
‡ Aerated, settled, limed and filtered.
† Treated to remove iron by filtration through iron-removing zeolite.

The influence of the nature of the water on the ease of removal of iron is illustrated by a comparison of the Madison and Iowa State College tap-water series to which ferrous chloride was added. The reaction of these waters was approximately the same, (*p*H 7.5 and 7.7) and the concentrations of iron (9.16 and 9.21 p.p.m.) were practically identical. In the lignin (64 p.p.m.) series the efficiency of iron-removal was practically the same for the two waters, removals of 96.8 to 98.7 per cent being effected in the Madison and Iowa State College waters, respectively. The efficiency of the commercial compound, however, when employing 64 p.p.m., was very much less with the Madison water than with the Iowa State College supply, the residual iron being 4.59 p.p.m. for the Madison, and 1.19 p.p.m. for the college waters, or reductions of 49.9 per cent and 86.9 per cent respectively. When higher concentrations of the iron-removers were employed, it was likewise observed that the efficiency of the inorganic commercial compound was distinctly greater for the college than for the Madison water, whereas with lignin there was no significant difference. The fact that lignin, as an iron-remover, appears to have wider application, both with respect to its use in these characteristically different waters and its more uniform efficiency against ferrous and ferric iron, is of interest when comparing the iron-removing capacity of lignin and of the inorganic commercial compound.

B. Relative Capacity of Lignin and Inorganic Commercial Compound for Iron Removal.

The purpose of the following experiments was to ascertain the capacity of a given quantity of an iron-removing compound (lignin or inorganic commercial compound) to function when reused in successive batches of iron-containing water.

Ferrous chloride was dissolved in the college tap water to give a concentration of about 35 p.p.m. of iron. To 500 c.c. of this iron-containing water in an 800 cc. beaker was added 0.125 gram (250 p.p.m.) of lignin and the mixture stirred continuously for one hour, at room temperature. The mixture was then filtered through filter paper and the iron remaining in the filtrate determined as previously described. The lignin remaining as a precipitate was then washed off with distilled water, dried, and reused for removing iron from another batch of water as described above. Similar experiments were performed employing 500 p.p.m. of lignin and 500 p.p.m. of the inorganic iron-removing commercial compound. The effectiveness of reusing these iron-removing substances with successive batches of water is indicated in Table II and shown graphically in Fig. 1.

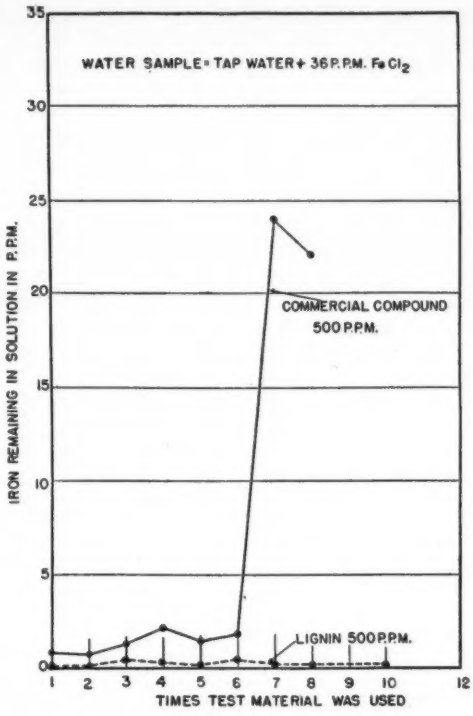


Fig. 1.

In the series employing 250 p.p.m. of lignin it will be noted that there was no significant difference in its efficiency as an iron-remover for the sixth as compared with its first use. A concentration of 37.27 p.p.m. of iron in the first run was reduced to 0.25 p.p.m. or an efficiency of 99.3 per cent. There was a slight fluctuation of about 2 per cent in the different runs but in the sixth run a concentration of 36.63 p.p.m. of iron was reduced to less than 0.1 p.p.m. or an efficiency of 99.7 per cent. It should be noted also that the reactions, which were slightly acid (*p*H 6.5 to 6.6) at the beginning of the experiments, be-

TABLE II—EFFECT OF REUSE ON EFFICIENCY OF LIGNIN AND COMMERCIAL COMPOUND AS IRON REMOVERS*.

Number of Times Test Material was Used		1	2	3	4	5	6	7	8	9	10
Observations with 500 p.p.m. Lignin											
Iron	At Start	32.34	36.64	36.64	36.64	36.64	36.64	36.64	36.79	36.79	36.79
in	At End	0.11	0.18	0.44	0.32	0.18	0.49	0.22	0.22	0.22	0.25
p.p.m.	Removed	32.23	36.46	36.20	36.32	36.46	36.15	36.42	36.57	36.57	36.54
Percentage Removal		99.90	99.45	98.75	99.00	99.45	98.55	99.30	99.50	99.50	99.32
pH at Start		6.6	6.6	6.7	6.7	6.6	6.6	6.7	6.7	6.7	6.6
pH at End		7.7	7.8	7.2	7.3	7.1	7.2	7.3	7.1	7.1	7.2
Observations with 500 p.p.m. Commercial Compound											
Iron	At Start	36.63	36.63	36.53	36.53	36.53	36.79	36.79	36.79		
in	At End	0.88	0.74	1.26	2.20	1.47	1.82	23.92	22.00		
p.p.m.	Removed	35.75	35.89	35.27	34.33	35.06	34.97	12.87	14.79		
Percentage Removal		97.60	97.98	96.55	93.98	95.98	95.05	34.98	40.20		
pH at Start		6.6	6.6	6.6	6.5	6.5	6.5	6.5	6.5		
pH at End		7.5	7.4	7.6	7.4	7.4	7.4	7.4	7.4		
Observations with 250 p.p.m. Lignin											
Iron	At Start	37.27	37.27	36.63	36.63	36.63	36.63				
in	At End	0.25	0.63	0.44	0.36	1.10	0.07				
p.p.m.	Removed	37.02	36.64	36.19	36.27	35.53	36.56				
Percentage Removal		99.33	98.31	98.80	99.02	97.00	99.70				
pH at Start		6.6	6.6	6.6	6.6	6.5	6.5				
pH at End		7.2	7.0	7.2	7.3	7.2	7.1				

* A sample of tap water + 36 p.p.m. $FeCl_2$ stirred for one hour in the 800 cc. breaker, filtered and tested for iron showed a loss of about 5 per cent.

came slightly alkaline (*p*H 7.0 to 7.3) after treatment with lignin.

In the series employing 500 p.p.m. of lignin, it was again observed that there was no decrease in efficiency when this lignin was reused many times; an efficiency of 99.9 per cent was observed in the first run and 99.3 per cent in the tenth run. Here, again, the hydrogen ion concentration of the water decreased after treatment with lignin but it should be noted that, whereas the reaction was *p*H 7.7 and 7.8 during the first two runs, thereafter it was 7.1 to 7.3.

The results with the commercial inorganic iron-removal compound are in market contrast to those reported above for lignin. With this compound the efficiency was not quite as high as that of lignin in the first run, though it was 97.6 per cent but thereafter decreased slightly until the sixth run, after which there was a precipitous drop from an efficiency of 95.1 per cent in the sixth run to 34.9 per cent in the seventh run. This break in the capacity of the commercial compound on its seventh reuse is particularly striking in view of the fact that with the same concentration of lignin no difference was observed even after reusing ten times. The commercial compound also served to change the reaction of the water from an initial *p*H 6.5 to 6.6 to a final *p*H 7.4 to 7.5

Summary and Discussion

The foregoing data are presented as a preliminary contribution to the problem of the possible utilization of lignin originating from agricultural materials. To the extent that it might find applicability in iron-removal processes, it would constitute one of the possible means of utilizing part of the vast quantities of lignin that are now going to waste. It may be feasible to utilize lignin in conjunction with existing water filtration plants, by adding the powdered lignin to the water in the mixing and sedimentation tanks or applying it to the water as it enters the filters in a manner analogous to the employment of activated carbon for odor removal.

It is desired to call attention to the fact that, in the experiments reported, the technic employed is analogous to that frequently used in treatment of water with activated carbon but that it is not comparable to filtration through zeolitic iron-removing compounds. Results with lignin employed as a filter medium comparable to those of the presently employed zeolitic compounds will have to be awaited in order to ascertain relative efficiencies.

The efficiency of lignin for the removal of iron was not affected significantly by the nature of the two waters employed or, in the cases where the reactions were not excessively acid, by the state of oxidation of the iron. On the other hand the inorganic commercial compound was not as efficient in one of the waters as with the other, and less efficient for ferrous than ferric iron. These facts indicate that lignin might have wider application than the commercial iron-removing compound in question.

Literature Cited

(1) Benson, H. K., Sulphite Liquor Disposal. Can. Chem. and Met., 21, 306 (1937).
(2) Clark, H. W., Occurrence of Iron in Ground Water and Early Experiments upon Removal. *J. New England Water Works Assoc.*, 50, 229 (1936).
(3) Collé, ——., The Removal of Iron from Water for Purposes of Chrome Dyeing. Melliand Textilber, 18, 521 (1937).
(4) Davis, D. E., Observations on Zeolites in Water Softening and Demanganization. *J. Am. Water Works Assoc.*, 29, 1515 (1937).
(5) Erickson, D. L., The New Iron and Manganese Removal Plant for Lincoln, Nebraska. *J. Am. Water Works Assoc.*, 27, 337 (1935).
(6) Etablissements Phillips and Pain, French Patent 788,348 (Aug. 5, 1935).
(7) Foulk, C. W., Industrial Water Supplies of Ohio. *Bull. 29, Geological Survey of Ohio*, 1925.
(8) Hale, Frank E., Iron Removal without Aeration—The Precipitation of Ferrous Carbonate in a Closed System. *J. Am. Water Works Assoc.*, 28, 1577 (1936).
(9) Hoover, Charles P., Water Supply and Treatment, *Bull. 211*, National Lime Association, 1936.
(10) Kammann, German Patent 590,170 (Dec. 27, 1933).
(11) Kerchoffer, W. G., Manganese Ore Filter Bed Removes Iron and Manganese. *Water Works Eng.*, 89, 1108, 1111 (1936).
(12) Kruger, Danish Patent 49,393 (Oct. 15, 1934).
(13) Lathrop, T. R., Advantages and Disadvantages of Various Iron Removal Devices. *Ann. Rept., Ohio Conf. Water Purification*, pp. 67 (1936).
(14) Levine, Max, Nelson, G. H., Anderson, D. Q., and Jacobs, P. B., Utilization of Agricultural Wastes, I. Lignin and Microbial Decomposition. *Ind. Eng. Chem.*, 27, 195 (1935).
(15) McGeorge, W. T., (a). The Base Exchange Property of Organic Matter in Soils. Tech. Bul. 30, Ag. Exp. Sta., Univ. of Arizona (1930); (b). Organic Compounds Associated with Base Exchange Reactions in Soils. *Tech. Bull. 31*, Ag. Exp. Sta., Univ. of Arizona (1931); and (c). Chemical Equivalent Base Exchange Reactions in Plants, *Plant Physiology*, 7, 119 (1932).
(16) Millar, H. C., Smith, F. B., and Brown, P. E., The Base Exchange Capacity of Decomposing Organic Matter. *J. Am. Soc. Agronomy*, 28, 733 (1936).
(17) Mitchell, John. The Origin, and Importance of Soil Organic Constituents Having Base Exchange Properties. *J. Am. Soc. Agronomy*, 24, 257 (1932).
(18) Muller, J. F., Some Observations on Base Exchange in Organic Materials. *Soil Science*, 35, 229 (1933).
(19) Octrovien, N. V., (a). Australian Patent 21,581 (Feb. 28, 1935); (b). French Patent 784,348 (Jan. 19, 1935).
(20) Phillips, Max. *J. Am. Chem. Soc.*, 50, 1986 (1928).
(21) Powers, W. L., Characteristics of Dispersable Organic Colloids in Peats. *J. Agric. Research*, 44, 97 (1932).
(22) Rosenheim, British Patent 286,307 (Sept. 2, 1929).
(23) Skinner, W. W., Chairman—The Committee of the United States Department of Agriculture on Industrial Utilization of Farm Products and By-Products. Preliminary Estimates of Farm Products, By-Products and Wastes Available for Industrial Use. (1935).
(24) Sutermeister, E. Chemistry of Pulp and Paper Making, second edition. New York, John Wiley and Sons, 1929.
(25) Tiger, H. L., and Goetz, P. C., United States Patent 2,069,564 (Feb. 2, 1937).
(26) United Water Softeners Limited, British Patent 450,574 (July 21, 1936).
(27) Waksman, S. A., and Iyer, K. R. N., (a). Contributions to Our Knowledge of the Chemical Nature and Origin of Humus, I. On the Synthesis of the "Humus Nucleus". *Soil Science*, 34, 43 (1932); (b). Contribution to Our Knowledge of the Chemical Nature and Origin of Humus, II. The Influence of "Synthesized" Humus Compounds and of "Natural Humus" upon Soil Microbiological Processes. *Soil Science*, 34, 71 (1932); and (c). Contributions to Our Knowledge of the Chemical Nature and Origin of Humus, III. The Base Exchange Capacity of Synthesized Humus (Ligno-Protein) and of Natural Humus Complexes. *Soil Science*, 36, 57 (1933).
(28) Wedekind, E., and Garre, G., Die Kolloidnatur der Ligninsäure und des sog. Kasseler Brauns; ein Vergleich. *Kolloid Zeit.*, 44, 205 (1928).
(29) Weston, Robert S., Some Problems of Deferrization and Demanganization. *J. New England Water Works Assoc.*, 50, 231 (1936).

Stream-Flow Vat

The Pusey & Jones Corporation, Wilmington, Del., in a bulletin just issued, announce the company's Stream-Flow vat and describe its exclusive, patented features. Among the advantages enumerated are ease of establishing conditions for ideal formation on any one grade; optimum formation conditions can be established for very different grades on the same machine and a wide variety of sheet characteristics produced on the same machine. The stream-flow vat by making the vat circle adjustable is stated to permit good formation with a much wider range of stocks, and permits large increase of capacity by allowing making conditions right for higher speeds.

St. Croix Paper Co. Nets $135,230

The St. Croix Paper Company reports for the year ended December 31, 1938 net income of $135,230 after all charges, including depreciation and federal taxes. After allowing for preferred dividends balance was equal to $4.34 a share on 25,000 shares of common stock. This compares with 1937 net income of $24,201, or $4.84 a share on 5000 shares of preferred stock. Balance sheet as of December 31, 1938 shows current assets of $1,544,164, including cash and securities of $262,297; current liabilities, $250,598; and net working capital, $1,293,566.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING MARCH 2, 1939

SUMMARY

Cigarette paper.....548 cs.
Paper hangings .....2 bls.
Newsprint .....2949 rolls, 21 bls.
Printing paper .....247 rolls, 39 bls., 167 cs.
Wrapping paper .....1399 rolls, 174 bls., 3 cs.
Drawing paper.....4 cs.
Filter paper .....13 cs.
Filter compound.....20 bls.
Tracing cloth .....4 cs.
Surface baryta coated paper .....16 cs., 86 crates
Metal covered paper.....8 cs.
Basic paper .....10 cs., 52 crates
Photo paper.....8 cs.
Decalcomanias ..... 38 cs.
Tissue paper .....1 cs.
Gummed paper .....1 cs.
Colored paper .....4 cs.
Cardboard .....7 cs.
Paper tubes .....153 cs., 192 ctns.
Miscellaneous Paper.....130 cs., 50 bls.

CIGARETTE PAPER

De Manduit Paper Corp., *Ile de France,* Havre, 2 cs.
Champagne Paper Corp., *Ile de France,* Havre, 470 cs.
Clark Frutier & Co., Ltd., *Ile de France,* Havre, 76 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Banker,* London, 3 bls.

NEWSPRINT

Perkins Goodwin & Co., *Hansa,* Hamburg, 212 rolls.
Jay Madden Corp., *Hansa,* Finland, 560 rolls.
——, *Bergensfjord,* Oslo, 197 rolls.
——, *Bergensfjord,* Skien, 464 rolls.
Jay Madden Corp., *Aachen,* Finland, 431 rolls.
Perkins Goodwin & Co., *Aachen,* Hamburg, 277 rolls.
Parsons & Whittemore, Inc., *August* Sundsvall, 201 rolls, 21 bls.
Nolan Bomall & Co., Inc., *August,* Sundsvall, 41 rolls.
——, *Rydboholm,* Hallstavik, 494 rolls.
——, *Rydboholm,* Norrkoping, 72 rolls.

PRINTING PAPER

Steiner Paper Corp., *Hansa,* Bremen, 4 cs.
Dingelstedt & Co., *Hansa,* Bremen, 147 rolls, 134 cs.
L. A. Consmiller, Inc., *Aachen,* Bremen, 28 cs.
Jay Madden Corp., *American Traveler,* Finland, 100 rolls, 39 bls.
S. H. Pomerance, *American Banker,* London, 1 cs.

WRAPPING PAPER

Jay Madden Corp., *American Traveler,* Finland, 174 bls., 1399 rolls.
Yardley & Co., *Queen Mary,* Southampton, 3 cs.

DRAWING PAPER

Titan Shipping Co., *Hansa,* Bremen, 1 cs.
Geo. Haas, *American Banker,* London, 3 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., *American Banker,* London, 13 cs.

FILTER COMPOUND

——, *Alex van Opstal,* Antwerp, 20 bls.

TRACING CLOTH

Titan Shipping Co., *Hansa,* Bremen, 4 cs.

SURFACE BARYTA COATED PAPER

Atlantic F'd'g Co., *Hansa,* Hamburg, 16 cs.
Globe Shipping Co., *Hansa,* Bremen, 86 crates.

METAL COVERED PAPER

K. Pauli & Co., *Hansa,* Bremen, 8 cs.

BASIC PAPER

Globe Shipping Co., *Hansa,* Bremen, 10 cs., 52 crates.

PHOTO PAPER

J. J. Gavin & Co., Inc., *Queen Mary,* Southampton, 8 cs., (unsensitized).

DECALCOMANIAS

Sellers Transportation Co., *Hansa,* Hamburg, 38 cs.

TISSUE PAPER

Marr Duplicator Corp., Inc., *Queen Mary,* Southampton, 1 cs., (coated).

GUMMED PAPER

G. W. Sheldon & Co., *Hansa,* Hamburg, 1 cs.

COLORED PAPER

D. C. Andrews & Co., *Aachen,* Bremen, 4 cs.

CARDBOARD

Coty Processing Co., *Ile de France,* Havre, 7 cs.

PAPER TUBES

——, *Hansa,* Hamburg, 153 cs.
——, *Aachen,* Bremen, 192 ctns.

MISCELLANEOUS PAPER

Keuffel & Esser Co., *Hansa,* Hamburg, 50 cs.
Remington Rand, Inc., *Kirishima Maru,* Kobe, 80 cs.
A. Giese & Son, *Ile de France,* Havre, 50 bls.

RAGS, BAGGING, ETC.

Loumar Textile By Products, Inc., *Schodack,* Havre, 183 bls. rags.
W. J. Green, Inc., *Schodack,* Havre, 54 bls. rags.
Chemical Bank Trust Co., *Schodack,* Havre, 15 bls. rags.
Brandwein Mazur & Co., *Schodack,* Havre, 56 bls. cotton waste.
Continental Bank Trust Co., *Schodack,* Havre, 120 bls. bagging.
The Barrett Co., *Schodack,* Havre, 433 bls. rags.
Richard Shipping Co., *Schodack,* Dunkirk, 159 bls. rags.
W. J. Green, Inc., *Schodack,* Dunkirk, 56 bls. jute cuttings.
E. J. Keller Co., Inc., *Fernbrook,* ——, 179 bls. rags, 145 bls. linsey garments, 75 bls. bagging.
W. Steck & Co., *Fernbrook,* Alexandria, 131 bls. bagging.
——, *City of Flint,* Dundee, 77 bls. paperstock.
National City Bank, *City of Flint,* Dundee, 172 bls. paperstock.
——, *City of Flint,* Leith, 193 bls. bagging.
——, *American Banker,* London, 31 bls. rags.
Richard Shipping Co., *Black Falcon,* Antwerp, 43 bls. rags.
Guaranty Trust Co., *Uruguay,* Buenos Ayres, 145 bls. rags.
Atlas Waste Manfg. Co., *Oriente,* Havana, 9 bls. cotton sweepings.
J. Cohen & Son Co., Inc., *Andania,* Liverpool, 16 bls. paperstock, 7 bls. rag cuttings.
——, *Andania,* Liverpool, 17 bls. rags.
Manufacturers Trust Co., *Andania,* Liverpool, 23 bls. rags.
Public National Bank Trust Co., *Andania,* Liverpool, 16 bls. rags.

OLD ROPE

W. Steck & Co., *Schodack,* Dunkirk, 109 coils.
National City Bank, *City of Flint,* Leith, 80 coils.
Chase National Bank, *American Banker,* London, 66 coils.
Continental Bank Trust Co., *Clara,* Algiers, 49 coils.
Chase National Bank, *Bristol City,* Bristol, 65 coils.

BONE GLUE

——, *Vulcania,* Trieste, 200 bags (sheets).

WOOD PULP

Irving Trust Co., *Bergensfjord,* Oslo, 625 bls. chemical pulp.
E. M. Sergeant Pulp & Chemical Co., *Bergensfjord,* Hygard, 250 bls. chemical pulp.
Chase National Bank, *Bergensfjord,* Oslo, 175 bls. sulphite.
J. Andersen & Co., *Bergensfjord,* Sarpsborg, 150 bls. sulphite.
The Borregaard Co., Inc., *Bergensfjord,* Sarpsborg, 360 bls. sulphite.
Waterfalls Paper Mills, *Bergensfjord,* Sarpsborg, 60 bls. sulphite.
Bank of The Manhattan Co., *Birmania,* Trieste, 706 bls. wood pulp.
Castle & Overton, Inc., *Aachen,* Hamburg, 10,800 bls. wood pulp, 2,160 tons.
D. M. Hicks, Inc., *Alex van Opstal,* Antwerp, 57 bls. wood pulp.

Absorbo Beer Pad Co., *Vulcania,* Trieste, 156 bls. wood pulp.
M. Sone, *August,* Sundsvall, 420 bls. dry pulp, 70 tons.
Cellulose Sales Co., Inc., *August,* Sundsvall, 2,850 bls. kraft sulphate, 475 tons; 4,200 bls. dry sulphite, 700 tons.
———, *August,* Hernosand, 1,925 bls. wet sulphite, 299 tons; 150 bls. dry sulphite, 25 tons.
Perkins Goodwin & Co., *August,* Hernosand, 600 bls. dry sulphite, 100 tons.
Bank of N. Y. Trust Co., *August,* Hernosand, 2,880 bls. dry mechanical pulp.
———, *August,* Hernosand, 120 bls. dry sulphate, 20 tons.
Price & Pierce, Ltd., *Rydboholm,* Kopmanholmen, 2,604 bls. unbleached sulphite; 678 bls. unbleached sulphate.
Stora Kopparberg Corp., *Rydboholm,* Skutskar, 265 bls. dry pulp.
Bulkley Dunton Pulp Co., Inc., *Rydboholm,* ———, 1,200 bls. sulphite, 200 tons.
———, *Hansa,* Hamburg, 250 bls. wood pulp, 27 tons.
Price & Pierce, Ltd., *Bertha Fisser,* ———, 2,502 bls. unbleached sulphate; 498 bls. unbleached sulphite.
Price & Pierce, Ltd., *Gunda,* ———, 6,300 bls. unbleached sulphite; 125 bls. unbleached mechanical pulp.

WOOD PULP BOARDS

———, *Hansa,* Hamburg, 300 bls.
———, *Hansa,* Hamburg, 50 bls. (sheets).
W. Bersch, *American Traveler,* Hamburg, 175 bls.

BOSTON IMPORTS

WEEK ENDING MARCH 2, 1939

———, *Schodack,* Havre, 19 bls. rags.
Castle & Overton, Inc., *Schodack,* Havre, 909 bls. rags.
Irving Trust Co., *Schodack,* Havre, 66 bls. rags.
Chase National Bank, *Schodack,* Havre, 271 bls. rags.
Stone & Downer Co., *Schodack,* Dunkirk, 1 cs. wrapping paper.
———, *Schodack,* Dunkirk, 39 bls. rags.
Storrs & Bement Co., *Binnendyk,* Rotterdam, 88 rolls printing paper.
Bankers Trust Co., *Birmania,* Trieste, 403 bls. wood pulp.
Bank of The Manhattan Co., *Birmania,* Trieste, 742 bls. wood pulp.
———, *Black Osprey,* Rotterdam, 12 bls. threadwaste, 13 bls. rags.
E. J. Keller Co., Inc., *Black Osprey,* ———, 641 bls. rags.
E. Butterworth & Co., Inc., *Black Osprey,* Antwerp, 88 bls. rags.
———, *Black Osprey,* 55 bls. threadwaste, 35 bls. rags.
———, *Aachen,* Bremen, 550 bls. wood pulp.
Bulkley Dunton Pulp Co., Inc., *Aachen,* ———, 250 bls. wood pulp, 50 tons.
———, *Clara,* Trieste, 1,400 bls. wood pulp.
Atterbury Bros., Inc., *August,* Sundsvall, 1,800 bls. dry pulp, 300 tons.
Bank of N. Y. Trust Co., *August,* Hernosand, 900 bls. mechanical pulp, 150 tons.
Pagel Horton & Co., Inc., *Korsholm,* Sweden, 4,000 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING MARCH 2, 1939

Gottesman & Co., Inc., *Rydboholm,* Sweden, 125 bls. wood pulp.
E. I. Bailey & Co., *Schodack,* Havre, 1 cs. drawing paper.
Castle & Overton, Inc., *Schodack,* Havre, 213 bls. rags.
Certainteed Products Corp., *Schodack,* Havre, 399 bls. rags.
De Manduit Paper Corp., *Schodack,* Havre, 761 cs. cigarette paper.
———, *Schodack,* Dunkirk, 27 bls. paperstock.
Bank of The Manhattan Co., *Birmania,* Trieste, 424 bls. wood pulp.
Guaranty Trust Co., *Aachen,* Hamburg, 1,050 bls. wood pulp, 215 tons.
———, *City of Flint,* Hamburg, 66 bls. 80 rolls newsprint.
J. M. Hagy Waste Works, *Black Falcon,* Antwerp, 45 bls. rags.
Commercial Bank of Greece, *Exermont,* Piraeus, 328 bls. rags.
Pagel Horton & Co., Inc., *Belos,* Sweden, 900 bls. wood pulp.
Price & Pierce, Ltd., *Belos,* ———, 13,050 bls. unbleached sulphite; 1,050 bls. unbleached sulphate.

WILMINGTON IMPORTS

WEEK ENDING MARCH 2, 1939

Pagel Horton & Co., Inc., *Belos,* Sweden, 5,460 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING MARCH 2, 1939

Gottesman & Co., Inc., *Rydboholm,* Sweden, 785 bls. wood pulp.
Gottesman & Co., Inc., *Toronto,* Sweden, 3,000 bls. wood pulp.
Goldman Sachs & Co., *Clara,* Trieste, 1,124 bls. wood pulp.
Castle & Overton, Inc., *Black Heron,* Rotterdam, 250 bls. wood pulp, 50 tons.
Congoleum Nairn Co., *Black Heron,* Antwerp, 324 bls. rags.
Atterbury Bros., Inc., *August,* Sundsvall, 1,200 bls. dry pulp, 200 tons.
M. Sone, *August,* Sundsvall, 4,800 bls. dry pulp, 800 tons.
Cellulose Sales Co., Inc., *August,* Sundsvall, 192 bls. kraft sulphate, 32 tons; 2,330 bls. dry sulphate, 405 tons.
Nolan Bowmall & Co., Inc., *August,* Sundsvall, 320 rolls newsprint.
Parsons & Whittemore, Inc., *August,* Sundsvall, 293 rolls newsprint.
E. M. Sargeant Pulp & Chemical Co., *August,* Hernosand, 1,200 bls. dry sulphate, 200 tons.
Bank of N. Y. Trust Co., *August,* Hernosand, 3,000 bls. dry sulphite, 500 tons.
Perkins Goodwin & Co., *August,* Hernosand, 1,200 bls. dry sulphite, 200 tons.
———, *August,* Hernosand, 3,942 bls. dry sulphate, 657 tons.
Pagel Horton & Co., Inc., *Etna,* Sweden, 4,500 bls. wood pulp.
Price & Pierce, Ltd., *Rydboholm,* ———, 210 bls. bleached sulphite.

NEWPORT NEWS IMPORTS

WEEK ENDING MARCH 2, 1939

Price & Pierce, Ltd., *Etna,* ———, 5,944 bls. unbleached sulphite.

NEW ORLEANS IMPORTS

WEEK ENDING MARCH 2, 1939

———, *Aachen,* Bremen, 300 bls. wood pulp.
Jay Madden Corp., *Aachen,* Finland, 109 rolls newsprint.
———, *Aachen,* Hamburg, 170 rolls newsprint.

MOBILE IMPORTS

WEEK ENDING MARCH 2, 1939

Jay Madden Corp., *Aachen,* Finland, 595 rolls newsprint.

Cushnoc Paper Co. Plant Sold

AUGUSTA, Me., February 28, 1939—The sale of the Cushnoc Paper Company property to the Pulp Corporation of New York which has been operating the mill for the last three years as the Kennebec Pulp and Paper Company, was announced last week.

The price was $196,259 as established in a decree by Supreme Court Justice James H. Hudson.

Sale of the mill assures Augusta of a stable industry which employs some 300 men and women.

The mill was for many years one of the leading industries of the city when it operated as the Cushnoc Paper Company. Following the depression the corporation went into receivership and Madison L. Gilman was named receiver. Through his negotiations and others, the mill was leased to the Hudson Pulp and Paper Company and it was changed from a newsprint mill into a tissue mill which has operated since 1936.

In December of this year the sulphite portion of the mill was destroyed by fire, but the company has continued to operate full time using pulp brought in by rail.

The rebuilding of the sulphite mill was still a question, but every indication pointed to the continued operation of the mill and a probability that the pulp manufacturing end of the mill would be rebuilt.

LATEST MARKET REVIEW

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, March 1, 1939.

The demand for some grades of paper is reported as a little improved for the week, although the general business situation reflects no tangible improvement. General business activity during the past few weeks has experienced a set-back and while the recession is not great, the movement at this date is against the seasonal upward trend. This state of general business is indicated by the index of general business activity, which stood at 88.9 per cent for the week ended February 18, compared with 89.4 per cent for the previous week, and with 79.0 per cent for the corresponding week last year.

No noteworthy change in the newsprint situation has been reported this week. Shipments in January 1939 were 16 per cent higher than in 1938, with publishers inventories a little lower. Consumption in January of this year was 5 per cent less than in 1938, and 12 per cent under January 1937. Prices remain firm and unchanged.

Reports from many manufacturers' representatives, jobbers, and wholesale paper merchants for the current week indicate little actual change in the market situation. Conditions in book papers are reported in some quarters of the trade as a little better. Little change has been reported in sulphite papers, other than a little improvement in the demand for some of the lower qualities of bond papers.

Kraft papers are a little less active for this week, a little decline being reported in both production and demand. This is viewed in the trade as more or less of a normal condition at this date and without particular significance. Prices remain relatively firm and unchanged at prevailing market quotations.

The demand for paper board is reported as a little improved for the week. Talk of an upward revision of prices continues. Prices are conceded to be low, and although news and chip board prices were increased two weeks ago in New England territory, prices in the New York area remain unchanged at prevailing quotations.

Mechanical Pulp

No important change in the demand for mechanical pulp has occurred this week. Quotations remain firm. Little change in the market situation is expected in the trade in the near future.

Chemical Pulp

No noteworthy change in the market situation of chemical pulp has been reported in the last two weeks. The volume of new business is currently less than in the final quarter of last year, but considerably better than for the corresponding period last year. Consumption is holding up fairly well. Prices are relatively firm, with the trade looking forward to increased activity during the latter part of the month and the first of April.

Old Rope and Bagging

Transactions in old rope continue on a limited basis. This market is steady with no important changes in prices reported. Trading in old bagging is limited also and the market is quiet, with prices conforming to prevailing market levels.

Rags

The domestic rag market continues unchanged from the situation prevailing for sometime. Demand is light and no changes in prices have been reported, except in No. 1 new white shirt cuttings which are higher this week, and currently quoted at from $6.80 to $7.00 per cwt. The foreign rag market continues inactive and nominal prices prevail.

Old Waste Paper

The dullness which has hung over the old waste paper market for many months was changed last week when the price of No. 1 mixed paper advanced about $1 per ton, and the same rise in price was reported on old curragated paper. Old kraft, machine compressed bales, is currently quoted at from .60 to .65 per cwt.; No. 1 mixed paper at from .17½ to .22 per cwt., while current quotations on strictly folded news range at from .37½ to .42½ per cwt.

Twine

No noteworthy change has been reported in the twine market for the current week. Quotations on all grades of hard and soft fiber twines remain firm and conform to prevailing market quotations.

Take Over Lawrence Box Plant

[FROM OUR REGULAR CORRESPONDENT]

LOWELL, Mass., February 27, 1939—Sharp & Blackadar, a new corporation, has taken over the paper box plant of the Lawrence Manufacturing Company. It is planned to make a general line of boxes to supply the needs of the Lawrence Manufacturing Company and some other customers. William E. Sharp, president and treasurer, of the new concern, continues as one of the executives of that company. Armand R. Blackadar, clerk, was foreman of the box plant, when it was a part of the Lawrence. Wilfred B. Maynard is the third incorporator.

H. L. Lockhart Heads Von Olker-Snell

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 27, 1939—At the adjourned annual meeting of stockholders of the Von Olker-Snell Paper Company, held February 20, Hubert W. Lockhart was elected president and treasurer and Alice E. Ralls, clerk. Joseph D. Snell, who died recently, had been treasurer of the company.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, March 1, 1939.

BLANC FIXE—Prices on blanc fixe continue firm and conform to prevailing market quotations. The pulp is quoted at from $42.50 to $45 per ton; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Quotations on bleaching powder are firm and unchanged at prevailing market levels. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein continues fair for the week. Standard domestic ground casein, 20-30 mesh, is quoted at from 8½ to 9 cents per pound; 80-100 mesh, at from 9 to 9½ cents per pound; all prices in bags, car lot quantities.

CAUSTIC SODA—Prices on caustic soda continue firm at prevailing market quotations. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and unchanged at prevailing market prices. Domestic filler clay is quoted at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per ton, ship side.

CHLORINE—Prices on chlorine are unchanged after the reduction of last week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The demand for rosin is reported as fair for the week. "G" gum rosin is quoted at $5; "F" wood rosin at $4.25 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is offered at $2.75 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Quotations on salt cake continue firm and conform to prevailing market prices. Quotations range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—Prices on soda ash are firm and unchanged at prevailing market levels. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The corn market is reported as weak for the week but quotations on corn starch remain unchanged. Globe pearl is quoted at $2.50 per 100 pounds; special paper starch at $2.60 per 100 pounds. All prices in bags, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina remain firm and conform to prevailing market prices. The commercial grades are quoted at $1.15; iron free at $1.30 per 100 pounds, in bags, car lot quantities, f.o.b., works.

SULPHUR—Prices on sulphur remain firm at prevailing market levels. Annual contracts are quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc continue firm at prevailing market levels. Domestic talc is offered at from $15 to $18 per ton, Eastern mines. Imported talc is quoted at from $20 to $40 per ton, on dock.

Market Quotations

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	@	—
Kraft—per cwt.—Delivered Zone A			
No. 1 Northern	$4.75	@	$5.25
Superstandard	4.12½	@	4.62½
Northern Standard Wrapping	4.00	@	—
Standard Wrapping	3.50	@	—
Tissues—Per Ream—Carlots			
White No. 1	.92½	@	—
White No. 1 M. G.	.90	@	—
White No. 1½	.67½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.60	@	—
Unbl. Toilet, 1 M.	3.20	@	—
Bleached Toilet	5.26	@	—
Paper Towels—			
Unbleached	1.80	@	—
Bleached	2.10	@	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	9.75
No. 2 Jute	7.50	@	9.00
No. 1 Manila Wrapping, 35 lb.	5.00	@	—
No. 2 Manila Wrapping, 35 lb.	4.75	@	—
Boards, per ton—			
News	27.50	@	30.00
Chip	27.50	@	30.00
Sgl. Mla. Ll. Chip	42.50	@	—
Jute Lined Chip	42.50	@	45.00
White Pat. Coated	55.00	@	57.50
Kraft Liners	42.50	@	45.00
Binders Boards	71.00	@	77.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	31.05	@ 36.50	32.20	@ 37.75
85% Rag	.....		29.90	@ 35.00
75% Rag	23.60	@ 27.75	24.75	@ 29.00
65% Rag	.....		21.65	@ 26.25
50% Rag	17.55	@ 21.50	18.70	@ 22.75
25% Rag	14.65	@ 17.75	15.80	@ 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$8.60	@ $10.50	$9.75	@ $12.00
No. 2	7.70	@ 9.50	8.90	@ 10.75
No. 3	6.85	@ 8.25	8.00	@ 9.75
No. 4	6.45	@ 7.75	7.60	@ 9.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$11.30	@	$12.75
No. 2 Glossy Coated	9.70	@	11.00
No. 3 Glossy Coated	8.60	@	10.00
No. 4 Glossy Coated	8.05	@	9.25
No. 1 Antique (watermarked)	8.05	@	9.25
No. 2 Offset	7.45	@	8.50
A Grade E. F.	7.20	@	8.25
A Grade S. & S. C.	7.45	@	8.50
B Grade E. F.	6.65	@	7.75
B Grade S. & S. C.	6.90	@	8.00
C Grade E. F.	6.40	@	7.50
C Grade S. & S. C.	6.65	@	7.75
D Grade E. F.	6.10	@	7.00
D Grade S. & S. C.	6.35	@	7.25

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	25.00	@	28.00
Dry	25.00	@	28.00
(Delivered)			
No. 1 Domestic and Canadian	29.00	@	33.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.25	@	2.75
Prime Qualities—			
Easy-Bleaching Sulphite	1.90	@	2.10
Strong Unbleached Sulphite	1.80	@	2.00
(On Dock, Atlantic Ports)			
Kraft Bleached	2.50	@	2.75
Kraft Light & Strong	1.60	@	1.75
Kraft No. 1	1.45	@	1.65
Kraft No. 2	1.40	@	1.45
(F. o. b. Pulp Mill)			
Kraft Domestic	1.25	@	1.75
(Delivered)			
Soda Bleached	2.55	@	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.80	@	7.00
Silesias No. 1	4.00	@	4.25
New Unbleached	6.50	@	6.75
Blue Overall	4.75	@	5.00
Fancy	2.00	@	2.15
Washables	1.50	@	1.60
Mixed Khaki Cuttings	3.00	@	3.25
O. D. Khaki Cuttings	4.00		4.25

Old Rags

White, No. 1—			
Repacked	2.90	@	3.15
Miscellaneous	2.10	@	2.25
White, No. 2—			
Repacked	1.50	@	1.60
Miscellaneous	1.25	@	1.40
Thirds and Blues—			
Repacked	1.30	@	1.40
Miscellaneous	1.15	@	1.20
Roofing Rags—			
No. 1	1.10	@	1.15
No. 2	.90	@	.95
No. 3 (bagging)	.60	@	.70
No. 4	.65	@	.70
No. 5A	.65	@	.70

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.20
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	—

J. Andersen & Co.

Selling Agents

21 East 40th Street

New York

CHEMICAL & MECHANICAL PULP

Kraft Pulp

BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
KALIX TRÄINDUSTRI AKTIEBOLAG
Vanoffärden, Sweden
MUNKSUNDS AKTIEBOLAG
Munksund, Sweden
NENSJÖ CELLULOSA A.-B.
Sprängsviken, Sweden

Bleached Sulphite

KELLNER-PARRINGTON PAPER PULP CO., LTD.
Sarpsborg, Norway
Edsvalla, Sweden
Hallein & Villach, Austria

Unbleached Sulphite

AKTIESELSKABET GREAKER CELLULOSEFABRIK
Greaker, Norway
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
CELLULOSEFABRIKS A.-G.
Bruntárova, Czecho-Slovakia
SVANÖ AKTIEBOLAG
Svanö, Sweden

WOOD PULP AGENTS

PRICE & PIERCE, Ltd.,

60 EAST 42nd ST.
NEW YORK

SHRED YOUR "BROKE" INTO A PROFITABLE PRODUCT

Shredded Paper Can Sell for Over $40 a Ton

The demand for shredded paper packing which is not obviously "waste" paper . . . which will dress up manufacturers' shipments and show their pride in their products . . . creates an opportunity for turning the disposal of your broke into profitable channels.

The process of shredding is a simple procedure with an "Industrial" Paper Shredder. It will handle your entire accumulation and produce an exceptional grade of attractive paper excelsior.

Easy to Operate

These shredders are designed for ease of operation . . . can be safely and efficiently run by unskilled worker. Rugged construction and mechanical simplicity minimize maintenance costs and eliminate servicing by outside expert.

Send Us Samples for Shredding

We will be pleased to shred your samples free of charge—permitting you to see the exact results.

INDUSTRIAL SHREDDER & CUTTER CO.

707 S. Elsworth St. Salem, Ohio

ENGLISH ECCO CLAYS CLAYS

ECCO CLAYS
TRADE MARK

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons.	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.75	@	1.90
Domestic	1.70	@	1.80
Wool Tares, light....	1.60	@	1.70
Wool Tares, heavy...	1.80	@	1.90
Bright Bagging.....	1.60	@	1.70
Manila Rope—			
Foreign	2.60	@	2.75
Domestic	2.00	@	3.00
Jute Threads.....	2.75	@	3.00
Sisal Strings.....	1.50	@	1.60
Mixed Strings.....	.55	@	.60

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.30	@	2.40
Ordinary Hard White No. 1....	1.90	@	2.00
Soft White No. 1..	1.60	@	1.75
Soft White Extra..	2.25	@	2.40
Flat Stock—			
Stitchless	.80	@	.85
Overissue Mag.....	.70	@	.75
Solid Flat Book...	.55	@	.60
Crumbled No. 1...	.40	@	.45
Ledger Stock White.	1.10	@	1.20
Ledger Stock Colored	.60	@	.70
New B. B. Chips....	.15	@	.20
Manila—			
New Env. Cut.....	1.40	@	1.50
New Cuttings.....	1.00	@	1.20
Old Kraft Machine—			
Compressed bales..	.60	@	.65
News—			
No. 1 White News	1.25	@	1.30
Strictly Overissue..	.40	@	.45
Strictly Folded....	.37½	@	.42½
No. 1 Mixed Paper..	.17½	@	.22½

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.12¾	@	.14¼
White Hemp.....	.13¾	@	.15¼
Fine Polished—			
Fine India.....	.16	@	.18
Unpolished—			
Box	.09½	@	—
Paper Makers.....	.09½	@	.10½
Tube Rope.....	.10¼	@	.12½
Wall Paper.....	.10¼	@	.12½
Wrapping	—	@	—
Soft Fiber Rope...	.12	@	.14
Cotton	.17	@	.20
(Hard Fiber)			
Medium Java.....	.11	@	.17
Mex. Sisal.....	.10	@	.16
Manila	.16	@	.23
Domestic	2.65	@	2.75
Sisal Rope.....	1.60	@	1.65
Mixed Rope.....	.40	@	.50
Transmission Rope...	1.90	@	2.00
Soft Jute Rope.....	1.80	@	2.00
Jute Carpet Threads.	.75	@	.90
Gunny Bagging—			
Foreign	1.65	@	1.75
Domestic	1.50	@	1.60
Bleachery Burlap...	2.50	@	3.00
Scrap Burlap—			
Foreign	1.55	@	1.65
Domestic	1.25	@	1.40
Scrap Sisal.....	1.25	@	1.40
Scrap Sisal for Shredding	1.75	@	2.00
Wool Tares, Heavy..	1.50	@	1.60
New Burlap Cuttings	2.00	@	2.25
Aust. Wool Pouches.	2.50	@	3.00
Heavy baling bagging	1.75	@	1.85
Paper Mill Bagging..	1.00	@	1.15
No. 2 Bagging.....	.50	@	.70

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints...	.03¼	@	.03½
New White No. 1...	.06¾	@	.07
New Light Flannelettes	.04¼	@	—
Silesias No. 1.....	.04¼	@	—
New Black Silesias..	.03¾	@	.04
Soft Unbleached.....	6.50	@	7.00
Blue Cheviots.....	.05	@	.05¼
Fancy	.03	@	.03¼
Washable	.02¾	@	.03
Cottons—According to grades—			
Blue Overalls.....	.04¼	@	.05
New Black, soft...	.03¾	@	.04
Khaki Cuttings.....	.03	@	.03½
O. D. Khaki.....	.04	@	—
Corduroy	.02¼	@	.03
New Canvas.....	.06¾	@	.07¼
B. V. D. Cuttings...	.06¾	@	—

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	1.75	@	2.00
Old Blue Overalls...	1.50	@	—
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.63¾
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.00	@	1.10
No. 2.....	.75	@	.85
No. 3.....	.65	@	.70

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	1.00	@	1.10
Dutch Blues.....	2.65	@	2.75
New Checks and Blues	2.85	@	3.00
Old Fustians.....	2.25	@	2.50
Old Linsey Garments	2.20	@	2.25
New Silesias.....	4.50	@	4.75

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.06	@	.06¼
New White, No. 2.	.03½	@	.04
Light Silesias.....	.03½	@	.04
Silesias, No. 1....	—	@	.04½
Black Silesias, soft	—	@	.03
New Unbleached..	.05½	@	.06
Washable, No. 1..	.01½	@	.01¾
Blue Overall.....	.04	@	.04½
Cottons—Acording to grades—			
Washable No. 2...	.01	@	.01¾
New Blue.....	.01	@	.01½
Fancy Percales....	—	@	.02½
New Black Soft...	.03	@	.03½
New Light Seconds	—	@	.04½
New Dark Seconds	.50	@	.75
Khaki Cuttings—			
No. 1 O. D.....	.03	@	.03½
No. 2 Mixed.....	.02	@	.02½
Corduroy	—	@	.02
New Canvas.....	.05	@	.05½
New Black Mixed.	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.25
Miscellaneous	2.50	@	2.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1....	—	@	1.20
Domestic No. 1...	—	@	1.10
Domestic No. 2...	—	@	.90
Roofing Bagging..	—	@	.80

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.75	@	2.00
Domestic	1.50	@	1.75
Manila Rope.....	—	@	3.50
Sisal Rope.....	1.50	@	1.75
Mixed Rope.....	.75	@	1.00
Scrap—			
No. 1.....	—	@	1.75
No. 2.....	1.00	@	1.25
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	.75	@	1.00
No. 1 New Light Burlap	2.50	@	3.00
New Burlap Cuttings	1.75	@	2.00

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.25	@	2.30
No. 2 Hard White.	1.90	@	2.00
No. 1 Soft White..	1.75	@	1.80
No. 2 Soft White..	1.30	@	1.40
No. 1 Mixed.....	.65	@	.75
Solid Ledger Stock..	1.45	@	1.50
Ledger Stock, white.	1.15	@	1.20
Ledger Stock, colored	.75	@	.80
No. 1 Books, heavy..	.60	@	.75
Manila Cuttings.....	1.45	@	1.50
Print Manila.....	.40	@	.45
Container Manila....	.35	@	.40
Kraft Paper.....	.75	@	.80
No. 1 Mixed Paper..	.20	@	.25
Straw Board Chip...	.25	@	.30
Binders Board Chip.	.25	@	.30
Corrugated Board...	.50	@	.55
Overissue News.....	.40	@	.45
Old Newspapers.....	.35	@	.40

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White..	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.30	@	—
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy..	.65	@	.75
No. 1 Books, light...	.65	@	.75
Crumpled Stitchless Book Stock.....	.55	@	.65
Manila Env. Cuttings	1.70	@	1.85
Manila Envelope Cuttings. Extra Quality	1.90	@	2.00
No. 1 Old Manila...	.65	@	.65
No. 1 Old Manila...	.80	@	.90
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	.80	@	.85
Mixed Papers.....	.15	@	—
Print Manila.....	.45	@	.55
Container Manilas...	.27½	@	—
Old Newspapers.....	.25	@	.32½
Paper Wool Strings..	.50	@	.65
Overissue News.....	.45	@	.50
Box Board Chips....	.20	@	.25
Corrugated Boxes....	.25	@	.30
Kraft corrugated boxes	.60	@	.70
Screening Wrappers..	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.65	@	2.75

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	1.80	@	1.90
No. 1 Hard White.	1.70	@	1.80
No. 1 Soft White..	1.50	@	—
Ledger & Writings..	.75	@	.80
Solid Books.....	.45	@	.50
Blanks	.90	@	—
Krafts	.45	@	.50
New Kraft Cuts.....	1.10	@	—
Manila Env. Cuts...	Nominal		
Ex. No. 1 Manila...	Nominal		
Print Manila.....	Nominal		
Overissue News.....	.35	@	—
Old Newspapers—			
No. 1 Folded News	.25	@	.30
No. 1 Mixed Paper	.15	@	.20
Roofing Stocks—			
No. 1.....	1.00	@	1.05
No. 2.....	.85	@	—

TORONTO

Paper

Bonds

Direct mill shipment in two-ton lots

No. 1 White	$35.50	@	—
No. 1 Tints	36.50	@	—
No. 2 White	25.50	@	—
No. 2 Tints	26.50	@	—
No. 2 Golden Rod..	27.50	@	—
No. 3 White	21.00	@	—
No. 4 White	15.00	@	—
No. 4 Tints	16.00	@	—
No. 4 Golden Rod..	17.00	@	—
Direct mill shipment in three-ton lots			
No. 5 White	$10.50	@	—
No. 5 Tints	11.50	@	—
No. 5 Golden Rod..	12.00	@	—
No. 6 White	9.00	@	—
No. 6 Tints	9.50	@	—
No. 6 Golden Rod..	11.00	@	—
No. 7 White	8.00	@	—
No. 7 Tints	8.50	@	—
No. 7 Golden Rod..	10.00	@	—
Book—			
No. 1 M. F.	$7.00	@	—
No. 2 M. F.	6.50	@	—
No. 3 M. F.	5.25	@	—
No. 1 S. C.	7.25	@	—
No. 2 S. C.	6.75	@	—
No. 3 S. C.	5.75	@	—

Coated Book & Litho

Ton Lots (resale)

No. 1	$12.00	@	—
No. 2	10.25	@	—
No. 3	8.90	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown.....	4.85	@	5.25
White Wrap.....	4.00	@	—
"B" Manila.....	4.90	@	6.15
No. 1 Manila.....	5.50	@	6.90
Fiber	5.50	@	6.90
Kraft No. 2.....	5.50	@	6.90

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)...	46.00	@	—
Sheets	54.00	@	—

Pulp

Ground wood.....	29.50	@	—
Bleached sulphite....	54.00	@	—
Unbleached sulphite..	44.00	@	—
Kraft	50.00	@	—
Soda	51.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.15	@	—
Soft White.....	1.90	@	—
White Blk. News..	1.25	@	1.10
Book and Ledger—			
Flat Magazine and Book Stock (old)	.70	@	—
Light and Crumpled Book Stock.	.60	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut..	1.35	@	—
Printed Manilas...	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue..	.50	@	—
Strictly Folded....	.45	@	—
No. 1 Mixed Paper..	.30	@	—

Domestic Rags

(Price to Mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06½	@	.06¾
Fancy Shirt Cuttings	.02¼	@	.03½